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TROPICAL DISEASES BULLETIN

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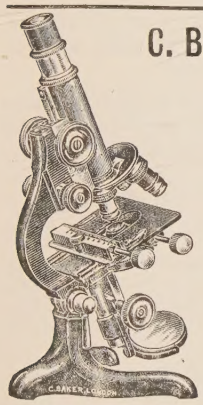

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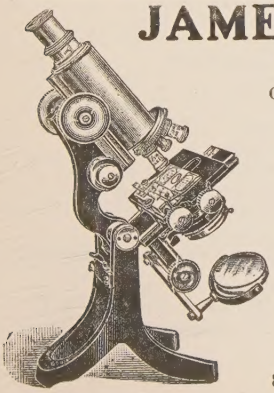

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TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 8.] 1916. [No. 2.

ENTERIC FEVERS IN THE TROPICS.

Typhoid—Paratyphoid A and B.

Sarrailhé (A.) & Clunet (J.). **La "Jaunisse des Camps" et l'épidémie de paratyphoïde des Dardanelles.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. Jan. 27. 3 ser. Vol. 32. No. 1–2. pp. 45–60. With 3 charts.

"Camp Jaundice" and the Paratyphoid Epidemic at the Dardanelles. [Extract from the Reports and Memoranda of the Paris Hospital Med. Soc., Jan. 21. 1916 Session.]—*Lancet.* 1916. Mar. 25. pp. 664–668. With 3 charts.

The authors draw attention to records of epidemics of jaundice in camps during warfare, often preceded by "intestinal fever," and state that "one month before the epidemic in the Dardanelles there appeared at Chatby Camp, in Egypt, an epidemic of jaundice associated with an epidemic of febrile intestinal infection." They found in the bacteriological laboratory of the Dardanelles Expeditionary Force favourable conditions for the study of a grave epidemic of "camp jaundice." The number of cases among French troops alone exceeded several thousands. Acknowledging kind help from M. Barbot and M. Baratte, Directors of the laboratory, and from colleagues in ambulances and regiments, the authors state that they were able to collect much information. With assistance from Col. Dudgeon, Col. Jones and Capt. Briercliffe they were able, also, to follow the course of the epidemic as it affected British troops. Soon after the landing of troops many cases of "febrile gastric disease" were noted.

Chart I. gives the weekly figures per 10,000 French and British, from June to December. The curve of the "typhoid group" of illnesses became lower in August but the "epidemic jaundice" began and increased rapidly until, at the end of September, it equalled in importance the earlier attack which it exceeded in October. Troops sent to Serbia took the infection with them and the epidemic of jaundice was still present in Salonika in January. No case of jaundice was observed among troops coming direct from France to Salonika. As no statistics were available it was not possible to determine the relation of the curve

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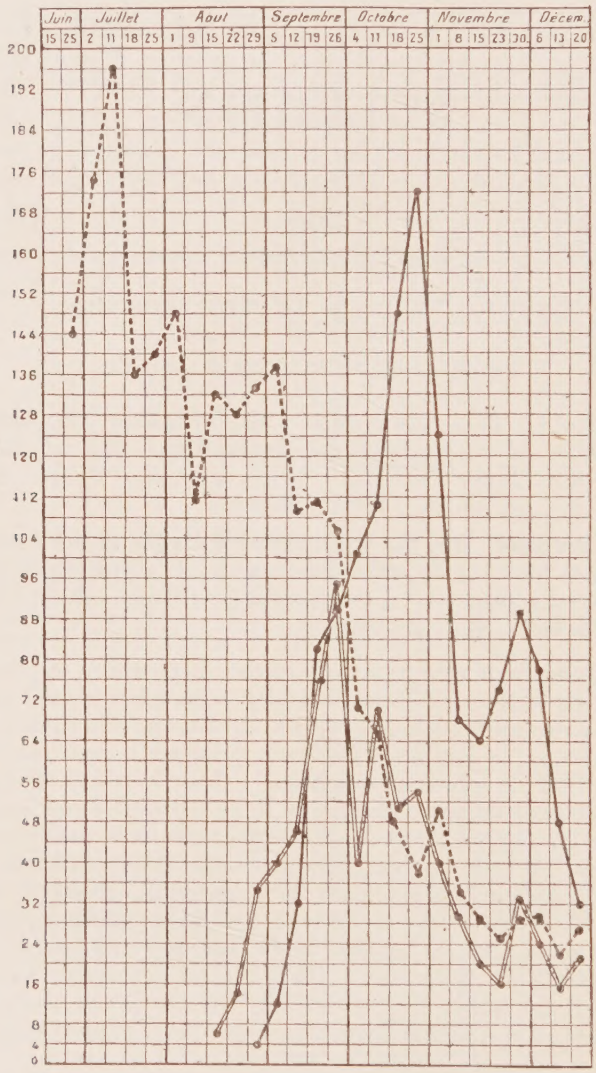
of jaundice to that of "febrile gastric derangement" among the British forces. From reports from intelligent Turkish prisoners it was learned that no cases of jaundice existed among the Turkish troops.

CHART I.*



Weekly figure (per 10,000 men stationed on the Peninsular of Gallipoli) of patients evacuated --- for febrile gastritis (French); ═══ for jaundice (French); ——— for jaundice (British).

The first case of jaundice appeared about the 10th August among some French sappers exposed to fatigue and hard work in the first line trenches. They were worried by heat, dust and flies. Cases came in

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in twos and threes and from the end of August the disease was found among all formations, and blood cultures showed that it was indeed an infectious jaundice. Before the epidemic of jaundice cases of true typhoid were rare. Most of the sick had been inoculated. The clinical condition which attracted attention during that period was the frequency of sudden attacks. The febrile gastric attacks from the end of August differed somewhat from those of the preceding period.

CHART II.*

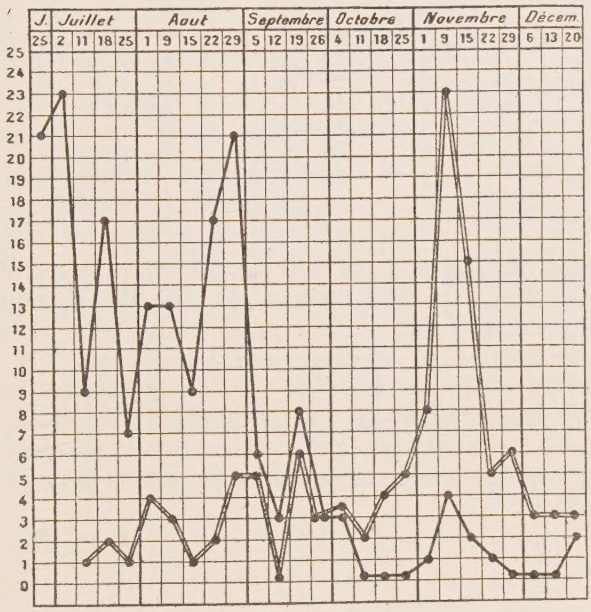

Table referring to the blood culture germs isolated at the Dardanelles from June 10th to December 20th, 1915. Of 606 blood cultures 312 were negative and 294 positive. Of these 294 germs, 182 were identified, including 35 typhoid and 147 paratyphoid B (Curve ———), 112 were atypical from their reactions upon culture media and in presence of the experimental serums (Curve ═══). Each point of the curves represents the number of germs isolated during a period of seven days.

True typhoid became still more rare. The epidemic diminished after November and the cases were less serious in type. Frequent hepatic symptoms were noticed: increase in size of liver, tenderness, enlargement of the gall-bladder; suppuration was rare, but one case is noted. The culture showed *B. paratyphosus* "B." The stools, sometimes diarrhoeic, generally became solid during the jaundice; they did not lose colour. Pruritus was absent. Convalescence was generally long with asthenia and often enlargement of the spleen. In a fatal case the post-mortem showed acute fatty degeneration of the liver,

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enlarged spleen and visceral haemorrhages. With the febrile cases were others of apyretic jaundice. 202 analyses of urine were made and the results are shown in a table given below.

Albumin.	Urobilin.	Biliary pigments.	Biliary salts.	Number of cases.	Albumin.	Urobilin.	Biliary pigments.	Biliary salts.	Number of cases.
+	+	+	+	35	+	0	0	0	7
+	+	+	0	34	0	0	0	0	7
0	+	0	0	24	0	+	0	+	6
0	+	+	0	20	+	0	0	+	4
+	+	0	0	18	0	+	+	+	4
0	0	+	0	13	0	0	+	+	3
+	0	+	0	12	0	0	0	+	3
+	0	+	+	11	+	+	0	+	1

Even cases of gastric fever without jaundice nearly all showed urobilinuria. From the 10th June to the 20th December, 606 blood cultures were carried out, various media being used. The typhoid bacillus was isolated on 30 occasions; paratyphoid "B" on 102. No paratyphoid "A" were found. In August atypical bacilli were found which though somewhat like paratyphoid "B" did not agglutinate with the experimental serum. Their appearance coincided with the jaundice epidemic and the authors named their paratyphoid "D" (*Dardanellensis*).

J. H. Tull Walsh.

SARRAILHÉ (A.) & CLUNET (J.). **La "Jaunisse des Camps" et l'épidémie de paratyphoide des Dardanelles. (Deuxième note.)**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. Apr. 20. 3 ser. Vol. 32 No. 13–14. pp. 563–567.

This article is a sequel to the note reviewed above. During the epidemic of "camp jaundice" the authors noticed certain atypical bacilli and to this group they gave the provisional name *B. paratyphosus* D. The present, or "second note," has been written with the object of clearing up the nature of these germs.

"The research includes 94 germs isolated by blood-culture in the Dardanelles and considered at the time of their separation as aberrant germs.

"Observed after four to six months of growth and sub-culture these germs did not all behave in the same way." Some remained atypical, some returned to type.

Reaction on Selected Culture Media.

No.	Number of strains examined.	Neutral red.	Lead acetate.	Litmus whey.
I	5	Changed	Darkened	"Chameleon" tints and cloud.
II	51	,,	No darkening	Rose-lilac.
III	33	,,	Darkened	Rose-lilac.
IV	1	,,	No darkening	"Chameleon" change and blue cloud.
V	4	No change	Darkened	Rose then flax blue with late cloud (48 hours); colour changes slow.

Group I, therefore, seems to behave like the ordinary *B. paratyphosus* B; group II like *B. paratyphosus* A, the change of the neutral red taking place rapidly with these germs; group III resembles *B. paratyphosus* A, but darkens the lead medium; group IV resembles *B. paratyphosus* B but does not darken the lead medium, while group V behaves like *B. typhosus* but the colour changes are slow in litmus whey, with late cloud.

Coarse Agglutination with Experimental Serums.

No.	Titre of Agglutination.	Serum Anti-A.	Serum Anti-B.	Serum Anti-Eberth.
I	1 : 2000	0	+	—
II	1 : 2000	+	0 Slight coagglutination up to 1 : 2000 but the serum Anti-A reached 1 : 4000	
III	1 : 2000	+	0	—
		In 10 cases coagglutination to 1 : 2000 but with A to 1 : 4000		
IV	1 : 2000	0	+	—
V	1 : 2000	0	0	+

Agglutination thus confirms the views gathered from results on culture media.

The authors took with them from the Dardanelles serums from several persons attacked during the epidemic. One of these specimens agglutinated (microscopically) all the para-typhoid bacilli of the epidemic up to 1 : 1000. Six months later, and after changes of temperature due to the voyage, this serum reached a titre of 1 : 500 for all groups.

The above experimental work is followed by some philosophical conclusions and speculations which show that the authors are not content with only the " dry bones " of research :—

" One must not hastily conclude that a microbian variety is new because at the time of isolation and during early culture we observe abnormal cultural characters together with non-agglutinability by specific serums. These peculiarities may disappear or become modified in course of time and with successive sub-cultures, the microbes regaining little by little the reactions of normal types.

" The phenomenon observed is one of Darwinian variation produced by nature under particular conditions of sanitation and climate. This phenomenon has the fugitiveness of most Darwinian variations and has not been able to fix a new variety. It is even probable that aberrant germs propagated in natural surroundings by contagion return more rapidly to normal types than those isolated in artificial media at the period of their variation, and preserved thereafter by sub-culture *in vitro*. Indeed a certain number of our strains from the Dardanelles are still atypical, while in the laboratory at Salonika we observed only a very small number of aberrant strains when the contingents from Gallipoli to Salonika brought their germs with them."

While it is admitted that preventive anti-typhoid inoculation greatly reduced the amount of typhoid fever it is noted that " troops not vaccinated against *B. paratyphosus* A and *B. paratyphosus* B were heavily attacked by these infections."

J. H. T. W.

FRUGONI (Cesare) & CANNATA (S.). **Ittero epidemico al campo da bacillo paratifo B.** [Epidemic Jaundice in the Field due to Paratyphoid B.]—*Sperimentale.* 1916. Apr. 17. Vol. 70. No. 1. pp. 25–40.

Notes made during an epidemic of jaundice in the Italian war-zone on 48 soldiers. By means of EINHORN's duodenal sound pure bile was drawn off from the duodenum and submitted to bacteriological examination. The organisms looked for were :—1, vibrios ; 2, haemolytic streptococci ; 3, B. Pfeiffer ; 4, *B. typhosus* ; 5, *B. paratyphosus* B ; the result being negative for the first three. *B. typhosus* was isolated once, and *paratyphosus* B no less than 11 times, making together 12 cases out of the 48, or 25 per cent., in which typhoidal organisms were present. The soldier from whose bile *B. typhosus* was isolated, had been inoculated against typhoid three times. Of the 11, three had not received any typhoid inoculation, one had had one injection, another one, two, and the remaining six, three inoculations, but against *B. typhosus* only. A positive agglutination to *B. paratyphosus* B in dilutions ranging from 1 : 50 to 1 : 200 was obtained in all the 11 patients from whom that organism was isolated, and a positive reaction to the same organism was also obtained in six soldiers, in whom the bacteriological examination of the bile had proved negative. These six men had not been vaccinated against *B. paratyphosus* B previously. In three cases out of the whole 48 *B. paratyphosus* B was isolated in pure culture from the stools. All blood-cultures were negative.

Reference is made to the recent conclusions of sundry French workers as to *B. paratyphosus* B being the causative agent of most of these epidemics of jaundice. [*cf.* contribution from SARRAILHÉ & CLUNET, reviewed above.]

J. B. Nias.

KENNEDY (Alex. Mills) & RUSSELL (B. R. G.). **Relapsing Paratyphoid "A" Infection.**—*Brit. Med. Jl.* 1916. Apr. 29. pp. 618–620.

From the details of this case the authors gather the following principal features :—

"1. A relapsing fever, due to infection with *B. paratyphosus* A. 2. Cultivation of the organism from the patient's own blood during the relapses. 3. Absence of diarrhoea. 4. Little or no leucocytosis. 5. Attempt to treat the infection with autogenous vaccine. 6. Absence of agglutinins to the infecting organism until after inoculation of vaccine."

The patient came to England, from Gallipoli *via* Malta, on October 7th, 1915. Taken ill three days later. Temperature "over 102° F., pulse 100 and respirations 24. He had headache and some vomiting but no diarrhoea, and there was nothing to be made out in any of the viscera; the spleen was not appreciably enlarged." The source of infection was not discovered. "From the 21st day after admission [Oct. 15th] until the morning of the 30th day there was practically no fever." The first relapse occurred on the 35th day of illness; temperatures 101° F. to 105·8° F. High temperature with morning remissions continued to the 44th day. Then "with increasing morning remissions the temperature gradually fell to normal on the morning of the 48th day." On the 58th day another relapse took place and yet another on the 95th day. The pyrexial attacks were alike, with rigors, headache, and some vomiting. Blood culture was made on the 36th day of illness. From cultures "in broth and in sterilized ox bile" "a pure growth of an actively motile Gram-negative bacillus which proved to be *B. paratyphosus* A" was obtained. "It fermented glucose and mannite, but with scanty gas production, gave no change in lactose, turned milk acid, and agglutinated strongly only with a specific paratyphoid A serum." The same bacillus was again obtained during the next relapse and the authors note that "the primary cultures required three and four days' incubation before growth became apparent." A vaccine was prepared and given at intervals in doses from 20 to 80 and 120 millions. "The agglutination titre of the patient's serum to his own *B. paratyphosus* A" was raised to "1 in 80 with a trace at 1 in 160." "On the 39th day of illness," previous to the vaccinations, agglutination with a *B. paratyphosus* A "could not be obtained beyond a dilution of 1 in 5." Otherwise the course of the disease does not seem to have been altered by the vaccine. The urine and faeces were examined, once during a relapse and again during final convalescence, "twenty-seven days after the termination of the last relapse." The authors "failed to recover any paratyphoid or other organism of the typhoid-dysentery group."

J. H. T. W.

SHEWELL (H. W. B.) & MARSHALL (C. Devereux). **On Some Cases of Paratyphoid which have occurred in H.M.S. "Euryalus."**—*Jl. Roy. Nav. Med. Serv.* 1916. Apr. Vol. 2. No. 2. pp. 169–179.

The authors believe that "owing to the success of inoculation against enteric fever, its power of evil has been so reduced that it need scarcely be considered as a really serious menace in a campaign." As the

result of bacteriological work they regard typhoid, paratyphoid A and paratyphoid B as "three distinct diseases, due to three different organisms." They consider the title "paratyphoid" "most unfortunate," because it has enabled anti-vaccinationists to state "that the profession has "invented" paratyphoid "simply because they know that inoculation is useless." The cases referred to in this article occurred "in and about the Eastern Mediterranean" among soldiers and sailors. It was not possible, except in a few cases, to carry out bacteriological blood tests, but the authors feel that "clinically, there can be no doubt as to the nature of the cases. Their diagnosis was confirmed by Col. WILLCOX, "who, besides seeing and examining eight or ten" of the cases, "felt no doubt as to the nature of the remainder." The cases varied in severity, some patients being very ill indeed; yet so far as the authors know there were no deaths. Some of the cases were transferred to hospital ships and lost sight of.

Four cases are given in full detail. "With two exceptions, all had been inoculated with anti-typhoid vaccine." The attack was frequently sudden. Headache was a marked symptom in "more than one" so "severe as to suggest meningitis." Other signs noted are :—"Tongue on dorsum covered thickly with a lightish-brown fur," often "khaki-coloured"; abdominal signs indefinite, "many cases had no spots at all while in others they were very atypical," rose-coloured spots when seen were like those of typhoid but larger; spleen usually enlarged within first eight or ten days; no enlargement of the liver, no jaundice; urine in most cases normal, but in a few cases a trace of albumin which disappeared after two or three days; emaciation (partly due to scanty diet and high temperature). The authors consider it "a notable fact that after the first few days in bed nearly all the patients complain of feeling very hungry, and this in spite of a temperature ranging from 101° to 103° F. or more." Experience proved the fact "which Col. WILLCOX insisted upon most strongly, that it is unsafe to allow a patient to have solid food until his temperature has been normal for several days, at least five or six." Neglect of this rule was followed by a relapse in one case and by a rise of temperature in one or two other cases. There was slight initial diarrhoea in some cases, but constipation was general throughout. The pulse rate is considered "a useful aid to diagnosis." "It is distinctly slow in relation to the temperature; often soft and compressible, and dicrotism has been noticed not infrequently." "The abdominal and other reflexes are retained throughout the disease, whereas in typhoid they are either lost or greatly diminished."

It was not possible to trace with certainty the origin of the disease on board the "Euryalus." It began at Port Iero, Mitylene, which appeared a healthy place. Many of the sailors were on shore duty and day leave was given to the men. Some of the patients "had not left the ship for months." The shore water and the ship's water were pure and "fairly exhaustive investigations" failed to discover "carriers." Flies and dust are considered to be "potent factors in disseminating the disease," and both these troubles were very prevalent. "It is no exaggeration to say that there were millions of flies on board both at Mudros and Suvla at both of which places there was a large number of horses." No drug had any marked effect on the course of the disease, but 15 grains doses of phenacetin relieved

the severe headache and lowered the temperature for some hours. Insomnia was treated with large doses of "bromide." "Cold or tepid sponging is indicated should the temperature rise above 104° F." The authors point out that "it is in preventive rather than curative measures that salvation from the disease lies," and justly think that when a trustworthy anti-paratyphoid vaccine is available "we shall not need to concern ourselves with the question of treatment."

J. H. T. W.

SUMMONS (Walter). **Report on the Enterica Cases at the First Australian General Hospital at Heliopolis.**—*Med. Jl. of Australia.* 1916. May 6. Vol. 1. 3rd Year. No. 19. pp. 375–377. Wlth 4 charts.

Before entering into the details of the cases of enteric fever described by Lt.-Col. Summons, A.A.M.C., it is important to note that he has, accepting General BABTIE's suggestion, distinguished the various causative bacilli under the generic name Enterica. This name has also been suggested independently by others and has much to recommend it. The necessary diagnostic tests were made at the Institute of Hygiene, Cairo, by Captain HUTCHENS, Lt. MYAT and others. The author states that "the blood culture was only of value in the first ten days of illness except in occasional cases in which the organisms persisted; in these cases the symptoms were severe."

"Blood Cultures.—Total performed 178

B. paratyphosus A	35
B. paratyphosus B	12
B. typhosus	3
Total	50

Negative results were obtained in 128."

All the patients were Australians who had been inoculated twice with anti-typhoid vaccine within twelve months prior to infection.

"Agglutination Tests.—Total performed 225

With *B. paratyphosus* A, positive in	77
With *B. paratyphosus* B, positive in	18
With *B. paratyphosus* A and B, positive in ..	2
With *B. typhosus*, strongly positive in ..	28
With *B. typhosus*, weakly positive in	37
Negative results were obtained in	63."

Previous inoculation would no doubt affect agglutination with *B. typhosus.*

It is stated that: "Paratyphoid A and Paratyphoid B seem to be clinically identical. From observations of a single epidemic, it has not been possible to differentiate the various infections except by means of the laboratory tests.

"The clinical aspect of the paratyphoid patient is different from that of the well-known typhoid picture. The patient does not look so ill, in spite of the temperature running on for weeks between 103° and 104°. The rash is decidedly more marked, and may be so distributed that it has some resemblance to that of measles; the spots, however, are situated only on the trunk and limbs, as far as the elbows and knees. They are pinkish, are not confluent, and vary in size, but usually are larger than those seen in typhoid fever. Again, the spots often appear late in the disease, during the third week, and when the fever is on the wane."

As many cases developed while the men were in hospital it was possible to note symptoms from the onset. They were "in order of prevalence":—

"(*a*) Gradual, with severe headache, that persists for a week, and an increasing daily rise of temperature;

"(*b*) with rigors and high temperature from the start, with little remission;

"(*c*) with a prodromal rise of temperature for three to five days, a period of normal temperature, lasting for one to four days, and, finally a prolonged period of fever;

"(*d*) simulating acute appendicitis, with vomiting. Some ten or a dozen cases were operated on, and the appendix removed, the inflammation of the appendix being part of a general inflammatory condition of the intestines;

"(*e*) with symptoms of acute gastro-enteritis; and

"(*f*) with signs and symptoms of pneumonia."

"Relapses were not uncommon, but when they did occur, were manifested by a repetition of the signs and symptoms of a milder degree."

The temperature charts show the usual "stair-case" type, and the bowels, except for some initial diarrhoea, were constipated. One patient died of haemorrhage but less than one per cent. suffered from melaena. The spleen was generally enlarged. Myocardial weakness was common with prolonged convalescence. "Phlebitis, cholecystitis and nephritis were less common complications. Few soldiers will have permanent damage as the direct result of the infection, and out of the 800 cases passed through this hospital there have been only five deaths."

As to the "source of infection and the value of prophylaxis" the author writes:—"The European and Egyptian predominating organism is *Bacillus paratyphosus* B, while in the Gallipoli infection *Bacillus paratyphosus* A has predominated largely. Paratyphoid A is common in India, and it may be that the Indian troops brought this organism." The value of anti-typhoid vaccine is admitted and the hope is expressed that similar vaccines against A and B will produce good results.

J. H. T. W.

LEMANSKI (W.). **Quelques observations de fièvres typhoïdes traitées par le vaccin fluoruré.**—*Arch. Inst. Pasteur Tunis.* 1916. Apr. 1. Vol. 9. No. 3. pp. 180–188. With 12 charts.

This communication contains the histories and temperature charts of twelve cases treated with a vaccine first issued by the Pasteur Institute of Tunis, in 1914, for protective inoculations against typhoid

fever. The dose used by Dr. Lemanski, 0·5 cc. containing 30 million typhoid bacilli, was injected on alternate days at the beginning of the illness, then at longer intervals. No unsatisfactory results were noticed. It is of course the physician's duty to guide his patients to recovery using the best means available; but where, as in most of these "observations," the treatment includes baths, sponging, camphorated oil, tincture of iodine and pyramidon in addition to the vaccine it is rather difficult to ascribe to each therapeutic agent its proper share in the favourable results. Case II is, however, free from this difficulty:—"M.—admitted about the 12th day of her illness. Sero-diagnosis positive; rose spots; hypertrophy of the spleen; dry tongue; diarrhoea, etc. No baths, no pyramidon [etc.] She received seven injections of the vaccine. The first three on alternate days."

Temperature, on admission 40° C., began to descend after the first dose of vaccine; there was steady improvement and the patient was discharged, cured on the 31st day.

Other cases did well under the combined treatment. Charts iv, v, vi, vii and viii show that the vaccine did not produce any marked effect on the disease.

The author is of opinion "that the hour has not yet arrived when it will be possible to accord entire confidence to anti-eberthian vaccinotherapy neglecting general treatment."

[For papers dealing with the successful treatment of typhoid fever with vaccines see *Bulletin*, Vol. 7, pp. 41, 42 and 43.]

J. H. T. W.

TAKAKI (Y.). **Some Complications in Typhoid Fever.**—*Sei-i-Kwai Med. Jl.* 1916. May 10. Vol. 35. No. 5. Whole No. 411. pp. 25–27.

The complications are those which lead to perforation of the intestines. The signs and symptoms are given in full detail and, as the author writes, there is but one way of treating this accident and that is by "laparotomy and closure of perforation." Two cases are described. In the first there were two perforations "situated about a foot from the ileo-caecal valve with one inch interval between them. The holes were closed by silk and the part was stitched close to the wound in order to keep watch over leakage." There were no complications and "she was completely cured."

The second case, a male, aged 38, was seized with severe pain, tenderness to right of the umbilicus, quickened pulse and increasing tympanitis during the third week of an attack of typhoid fever. These symptoms led to a diagnosis of perforation, "but in performing laparotomy it was found to be an intestinal obstruction. The obstruction was in the ileum about 7 inches from the caecum and was a horse-shoe

shaped adhesion 2½ inches long. It seemed to have been caused by an acute appendicitis seven years ago (his appendix was excised at the time and he suffered from occasional abdominal pain from that time)." The adhesion was separated but recovery was delayed by pneumonia and myocarditis and only complete four months later.

J. H. T. W.

TRESTON (M. L.). **Some Cases of Typhoid and Paratyphoid.**—*Indian Med. Gaz.* 1915. Sept. Vol. 50. No. 9. pp. 335–336. With 5 charts.

This is a very condensed paper dealing with cases among Indian troops (37th Dogras; 2/4 Gurkha Rifles). The author states that in the cases under observation very few of the signs and symptoms generally characteristic of typhoid fever in colder climates were present.

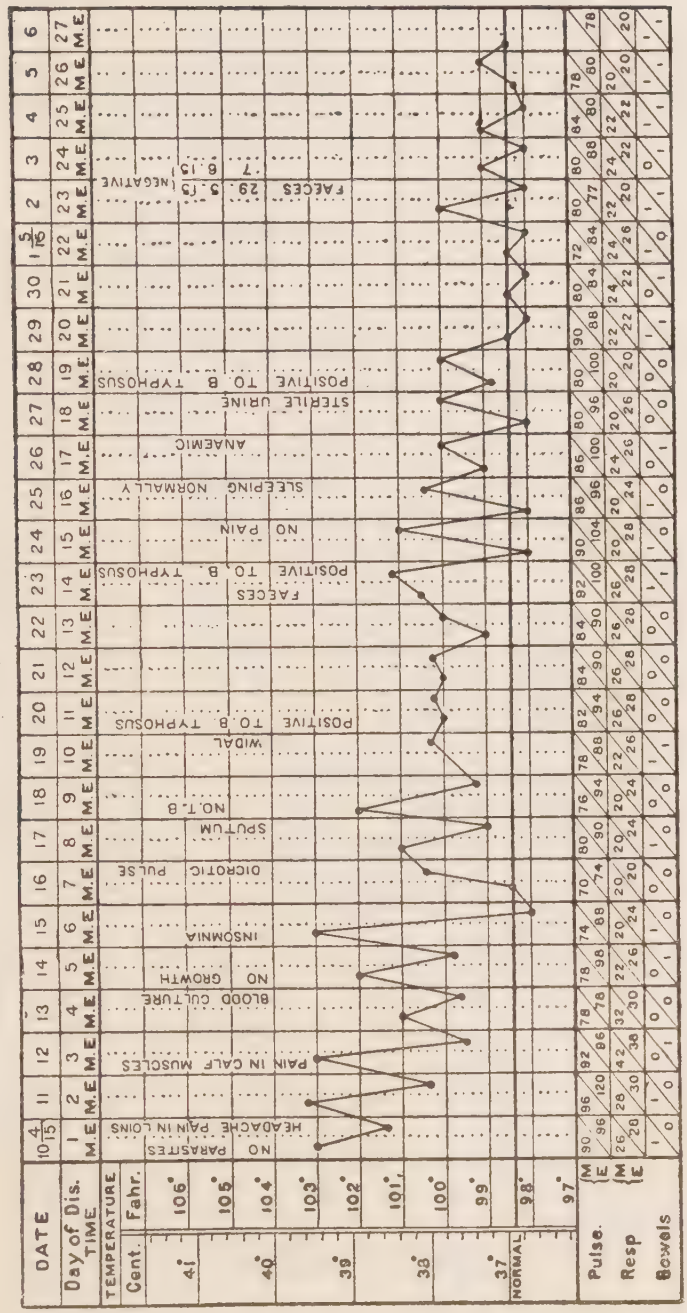
"Headache was universal and frontal in type. One patient complained of epigastric pain, another of pain in the R.I.F. The other cases gave no pain symptoms."

"Fever, distinctly atypical, and though subsiding by lysis, irregular as to time. In no case was the heart in any way affected, the pulse was the usual slow type, showing marked dicrotism at the end of the first week and becoming normal at the end of the second week. Blood showed no leucopaenia but eosinophilia was observed in nearly all cases."

The typhoid cases were not serious, there were no deaths and no complications. The paratyphoid cases were of the "A" variety There were relapses in two cases and two deaths, one from "haemorhage, lower part of ileum. Three eroded arteries about six inches apart." "The other died from superadded acute pneumonia." [Total number of cases and name of hospital in which they were treated are not given.] In the paratyphoid cases "headache of the occipital type extending down the neck was universal; there was no rigidity." The other marked symptom was "abdominal pain" (80 per cent.) "general or localised in the epigastrium, or in the right hypochrondrium, seldom in the R.I.F., coming on towards the end of the first week, never of great severity, and usually subsiding with the temperature." "Here again blood examination yielded marked eosinophilia, and in connection therewith, in five cases (33 per cent.) the ova of anklystomata [sic] duodenalis found in the faeces, while two other cases served as hosts for the ascaris." [It is possible that the cases of typhoid showing eosinophilia were troubled with parasites.] The course followed for diagnosis was :—"Blood culture on the 4th day, Widal on the 10th day, faeces on the 15th day, and urine at about the end of the third week." Culture (MacConkey's); "subculture (Agar); agglutinization test up to 1/200 dilution." Food and water supply were examined but no source of infection discovered. Camp followers, etc., were examined and "two typhoid carriers were thus isolated; one a 'sweet-seller,' and the other a butcher."

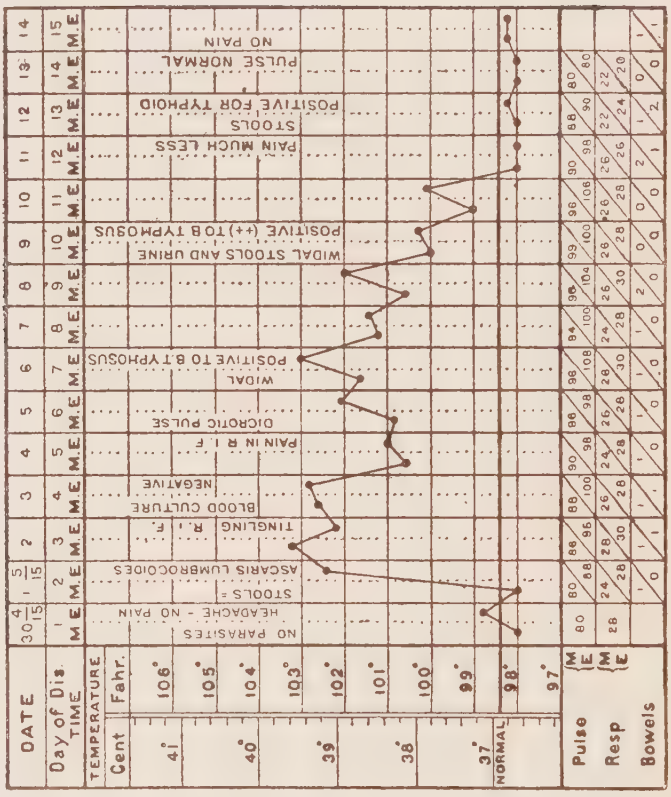
J. H. T. W.

CHART I.



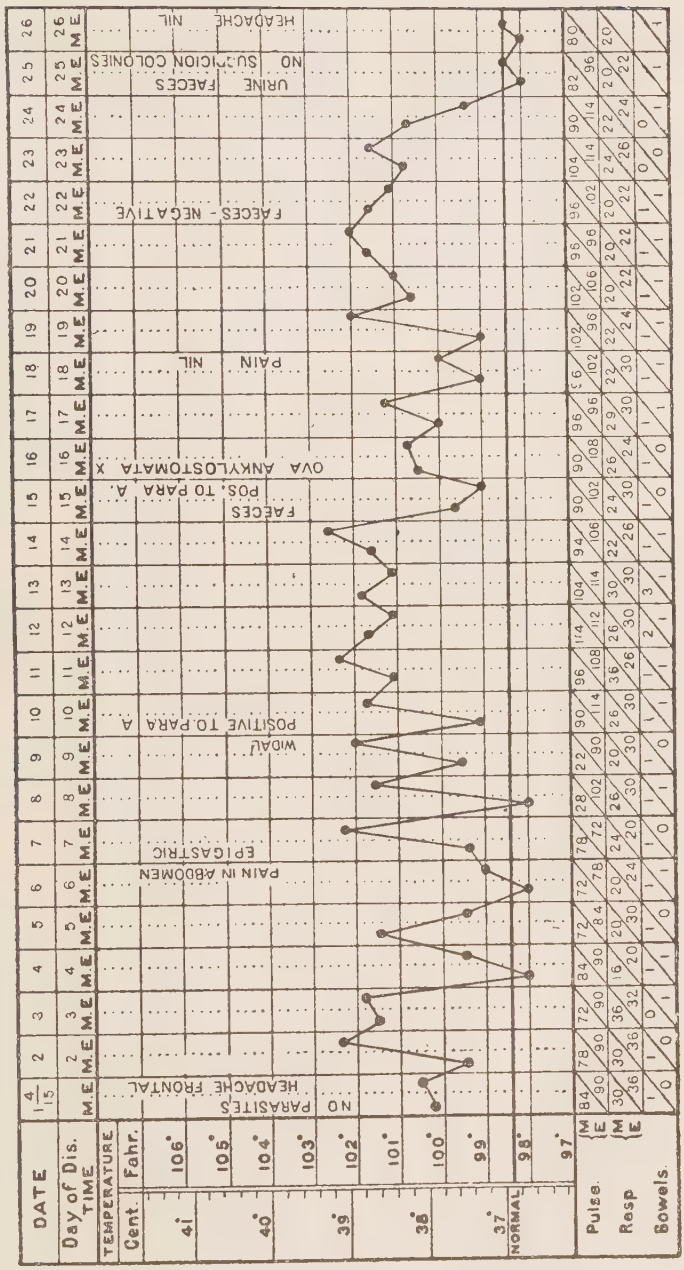
No. 2771. B.S., 37th Dogras. Age 20. Typhoid. No complications. Recovery.

CHART II.



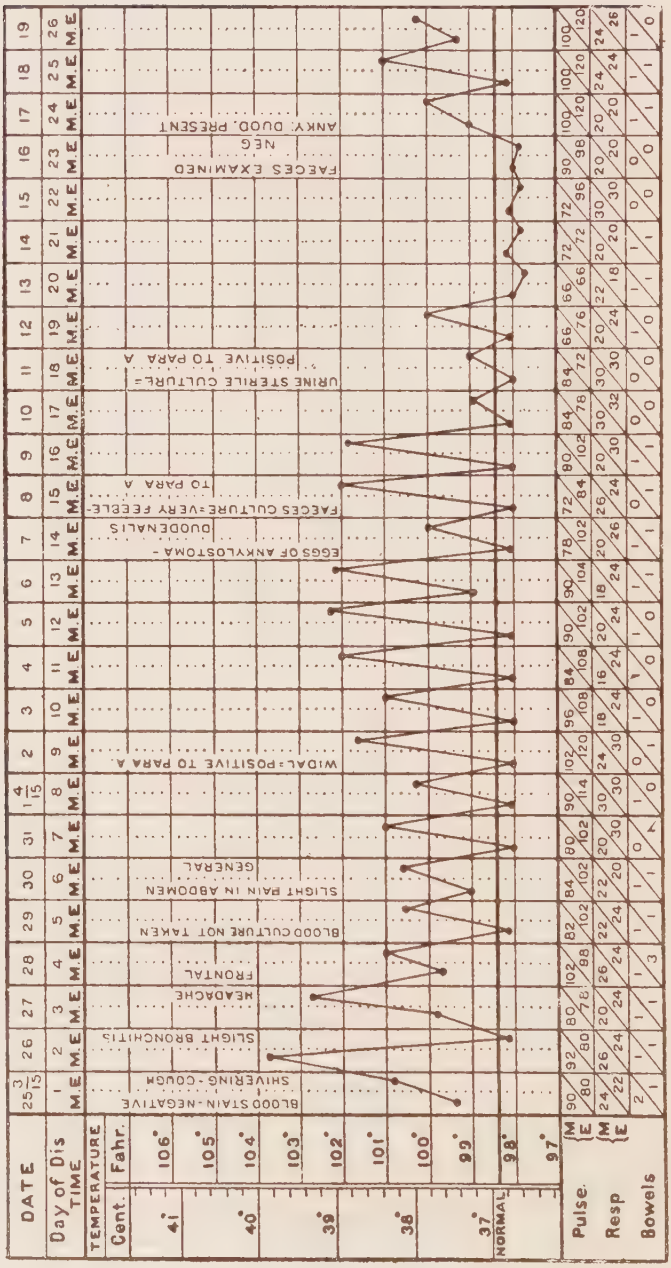
No 2778. S.S., 37th Dogras. Age 18. Typhoid. No complications. Recovery.

TRESTON (M. L.). *Indian Med. Gaz.*] CHART III. [*Trop. Dis. Bull.*



No 3362. R.G., 2/4 G.R.F.F. Age 20. Para-Typhoid, No relapse. Recovery.

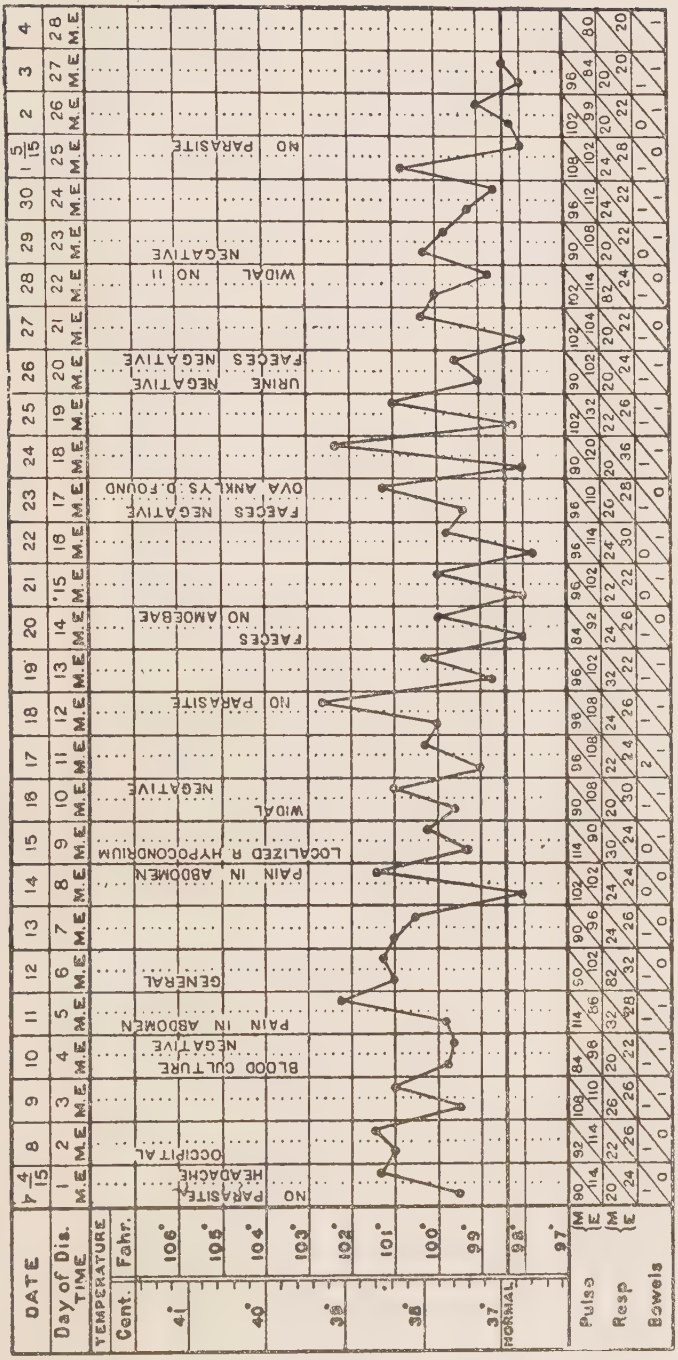
CHART IV.



No. 3437. P.L., 2/4 Gurkha Rifles. Age 17. Para-Typhoid- A relapse. Recovery.

TRESTON (M. L.). *Indian Med. Gaz.*]

CHART V.



No. 3349. Jasbahadur Gurang, 2/4 G.R. Age 20. P.U.O. Recovery.

MONJARDINO (Jorge). **Febre typhoide nos paizes quentes. (Alguns casos).** [Typhoid Fever in Tropical Countries. A Few Cases.]—*Med. Contemporanea.* 1915. Dec. 5. Vol. 33. No. 49. pp. 393–394; Dec. 19. No. 51. pp. 415–418. With 9 charts.

A short paper in which the author recounts his experiences of typhoid fever in Portuguese East Africa, based upon the rather small number of 30 cases, of which six proved fatal. The observations recorded do not do more than confirm what is said in the text-books about the peculiarities of typhoid fever in hot climates; abrupt commencement, fluctuating temperature curve, and so forth. Some interesting temperature charts are given illustrating these points. J. B. N.

GOMES (Emilio). **Febre typhoide no Rio de Janeiro.** [Typhoid Fever at Rio de Janeiro.]—*Brazil Med.* 1916. Mar. 25. Vol. 30. No. 13. pp. 97–98.

A short abstract of a communication made to the Medico-Chirurgical Association of Rio de Janeiro. The author considers that the prevalence of typhoid in Rio in no way depends upon the potable water-supply, but is due to (1) vegetables contaminated by infected irrigation-water, (2) direct contagion from individual to individual, (3) typhoid-carriers, (4) flies. J. B. N.

SERGENT (Edmond) & NÈGRE (L.). **Vaccinations mixtes anti-typhoidiques et antiparatyphoidiques dans l'Armée de l'Afrique du Nord.**—*Bull. Acad. Méd.* 1915. Oct. 26. Vol. 74. No. 43. pp. 469–472.

The authors mention that M. LANDOUZY called attention in December 1914 to the "increasing frequency in the French army of paratyphoid infections relatively to the number of typhoid infections by Eberth's bacillus." They give a reference to his contribution and to several important communications connected with the question of combining anti-paratyphoid with anti-typhoid vaccine. Observations made in the Algerian Pasteur Institute showed that in Algeria there exists "one case of paratyphoid for three or four cases of true typhoid." "The infections by paratyphoid 'A' are more numerous than the infections by paratyphoid 'B.'" In October 1914 the authors decided to use a mixed vaccine prepared by Vincent's method. It contained 400,000,000 typhoid bacilli per cc., and 200,000,000 paratyphoid per cc.; it was prepared from five strains of typhoid bacilli, two strains of paratyphoid 'A' and one strain of paratyphoid 'B,' "all isolated from Algerian patients. Each man received (in four inoculations) 3,300,000,000 bacilli."

"From the 12th October 1914 to the 12th October 1915 there were issued to the army of North Africa 583,207 cc. (for 106,037 vaccinations) of the triple, mixed anti-typhoid and anti-paratyphoid vaccine. More than 100,000 vaccinations were carried out. The reactions, local and general were not more marked than in the 37,000 vaccinations done in the same area with a simple anti-typhoid vaccine prepared in the same way. This vaccine was shown to be efficacious against both paratyphoid A and B and against typhoid fever."

The results are stated to have been favourable and General MOINIER and Medical Inspector General E. CALMETTE were surprised to find the typhoid wards in the military hospitals closed. "The almost total suppression of cases of typhoid and also of paratyphoid among soldiers

properly vaccinated dates from the autumn of 1914." Rare cases occurred among some who had escaped vaccination. There was a marked contrast between this state of affairs and the epidemic which continued as usual among the Algerian civil population. Among the garrison of Algiers, almost all vaccinated, there were no cases of typhoid or paratyphoid, while 14 occurred among certain soldiers not inoculated or insufficiently protected. J. H. T. W.

COPPINGER (C. J.) & GIBSON (H. G.). **Inoculation of Man with Mixed Vaccines containing** *Bacillus typhosus*, *B. paratyphosus* **A, and** *B. paratyphosus* **B, with Regard to the Reaction produced and the Antibody Formation.**—*Jl. Roy. Army Med. Corps.* 1916. May. Vol. 26. No. 5. pp. 581–596.

The authors are officers in the "R.A.M.C." and the men chosen for inoculation were men of that corps not specially selected, "except in so far as was necessary to ascertain that they had neither suffered from enteric fever nor had been previously inoculated." This refers to groups A, B, C, and E. Group D contained six men, inoculated at the Royal Army Medical College. Three of this group had previously been inoculated with anti-typhoid vaccine. The men in the other groups were inoculated at the R.A.M.C. Depot at Aldershot.

Groups A and C—Inoculated on the afternoon of December 3rd, 1915. They were excused duty on the Saturday and Sunday and all of them returned to duty on Monday, December 6th.

Seventy-three men (Group C) received a single dose of 1 cc. of a vaccine containing *B. typhosus* 1,000 million, *B. paratyphosus* A and B, of each 750 million. Forty-eight men (Group A) were inoculated with 1 cc. of a vaccine containing *B. typhosus* 1,000 million, and *B. paratyphosus* A and B, of each 500 million. It was discovered that 35 men in this group had, about five days before, been vaccinated against small-pox. No other men being available the experiment was carried on.

"After a certain number of inoculations in the left arm, the remainder of those showing signs of inflammation due to cow-pox were inoculated in the right arm." Fifty-two men in Group C had also been vaccinated seven days previously, but "a greater number of the '500-million' series were inoculated in the vaccinated arm than was the case in the '750-million' series."

The onset of reaction was earlier than in inoculation with a simple anti-typhoid vaccine and many of the men stated that they began to feel ill two and a half to three hours after inoculation. Local reaction was more marked, with redness and swelling and pain, seen to a greater extent in Group C than in Group A. The temperature of each man was taken 4 hours, 17 hours and 27 hours after inoculation. The febrile reaction was greater in the "500-million" series in whom the cow-pox vaccine was more active but "on the whole the general reactions were not more severe than those observed when one cubic centimetre of typhoid vaccine was given in August and October, 1914."

The vaccine used for these groups was prepared as follows :—

"A trypsin broth culture of *B. typhosus* grown for forty-eight hours, and was heated for one hour at 53° C., after which lysol was added to such an amount that the final lysol content was 0·4 per cent.

"The paratyphoids were grown separately on trypsin broth agar in Roux bottles for forty-eight hours, washed off with normal saline, heated for one hour at 53° C., and then had lysol added as in the case of *B. typhosus*."

The bacilli were counted before killing and the three vaccines mixed.

Group B, 12 recruits, received 1 cc. of a vaccine similar in numerical value to that given to Group A, but in this instance *B. typhosus* was grown on agar as in the case of the paratyphoids. There was nothing remarkable about the local reaction and the authors state that "the general reaction following the use of this vaccine was distinctly less than that following a similar dose of a broth vaccine, but somewhat delayed in its development." The local reaction was less.

Group D, six men, received two doses of the "500-million" vaccine, 0·5 cc. followed, after an interval of ten days, by 1 cc.

Group E, 90 men, received 0·5 cc. and subsequently 1 cc. of the "750-million" vaccine and both local and general reactions were mild.

From each of these groups a certain number of men were selected ten days after the inoculation for estimation of agglutination production. "The end-point of agglutination was determined by arranging the specimens of blood from each group in batches of five or six and pooling the sera of each batch." Similar estimations were carried out 21 days and 42 days after the final date of the inoculation. The method employed was as follows:—"The agglutinin content of the blood was estimated twenty-four hours after the blood had been drawn off. The emulsion was drawn well up into the shoulder of a capillary tube, placed in the 37° C. incubator for two hours and the result was finally read at the end of twenty-four hours." The authors lay stress on the necessity for uniformity of information as to methods employed and ascribe divergent results to "the use of different methods of estimation."

As to the general results they are well shown in Chart III.

In Group D the authors "were in some cases able to estimate the opsonin production as well as the agglutinins produced." "The antibody production was first estimated in this group and the two seemed to follow each other so closely that for purposes of comparison between the groups the opsonin estimation was afterwards dropped."

Charts I and II give the results in two examples from Group D.

"The opsonin production in this series of experiments was estimated after heating the serum for half an hour at 55° C. The emulsion used was twenty-four-hour culture on agar emulsified in normal saline and standardized to contain 1,000 million organisms per cubic centimetre. The mixture of serum, blood cells, and emulsion was then placed in water-bath for fifteen minutes. Klien's method * of estimating the end-point was used, taking 0·5 organism phagocyted per cell as standard."

The authors' conclusions are:—

"(1) That the highest dosage used is the best for producing lasting antibodies against these three organisms, and that the vaccine should be given in two doses rather than in one [cf. Chart III, Groups C and D] both on account of the reaction produced by a single dose of one cubic centimetre, and also on account of the higher antibody content produced when two doses are given."

"(2) The want of antibody production for *B. paratyphosus* A is a very strong feature of these experiments when compared with those elaborated for *B. typhosus* and *B. paratyphosus* B. As to the immunity produced against this organism, that can only be decided by actual trial, but the results obtained in the course of these experiments seem to point to the fact that the *B. paratyphosus* A content of the vaccine may not achieve its object to the same extent as that of *B. typhosus* and *B. paratyphosus* B."

J. H. T. W.

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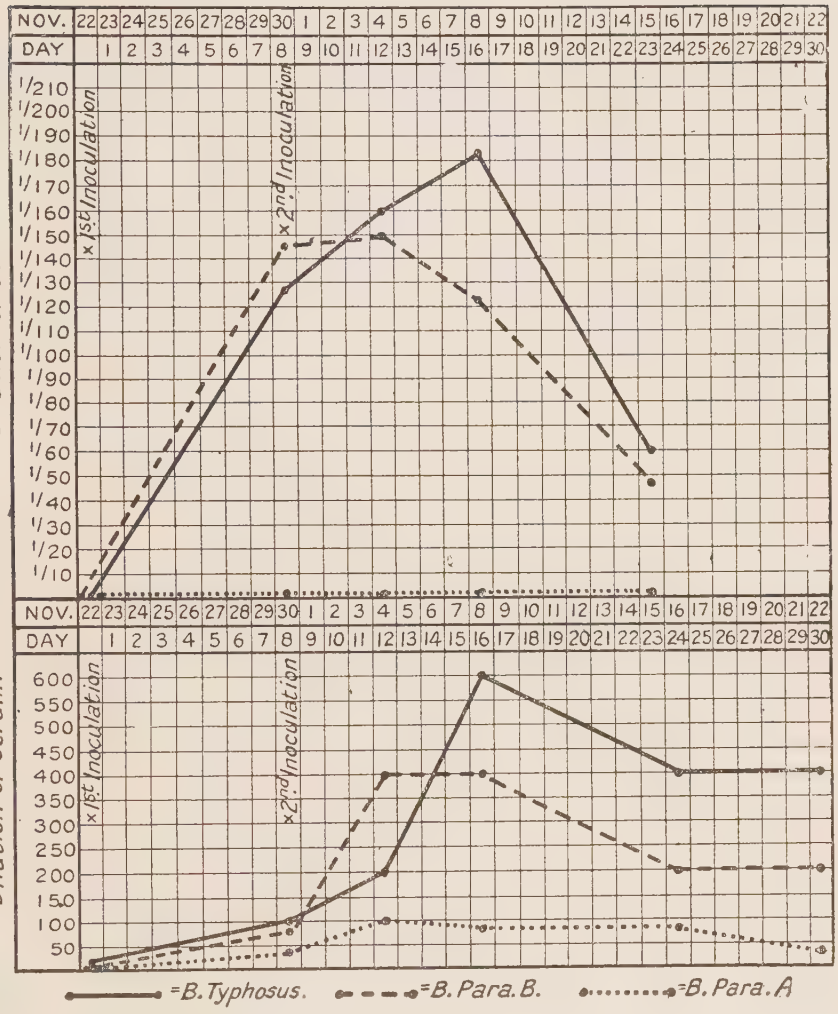
* *Bull. Johns Hopkins Hosp.* 1907. p. 245.



* CHART I. The above represent the agglutinin and thermostable opsonin curves of a man in Group D receiving two doses of a vaccine containing 1,000 million *B. typhosus*, 500 million Para. A, and 500 million Para. B per cubic centimetre. The opsonin content of the serum for *B. paratyphosus* A is shown along the base-line as the end-point was never demonstrable in a higher dilution than 1·9, which is no better than some of the normal controls. *This man had very little reaction.*

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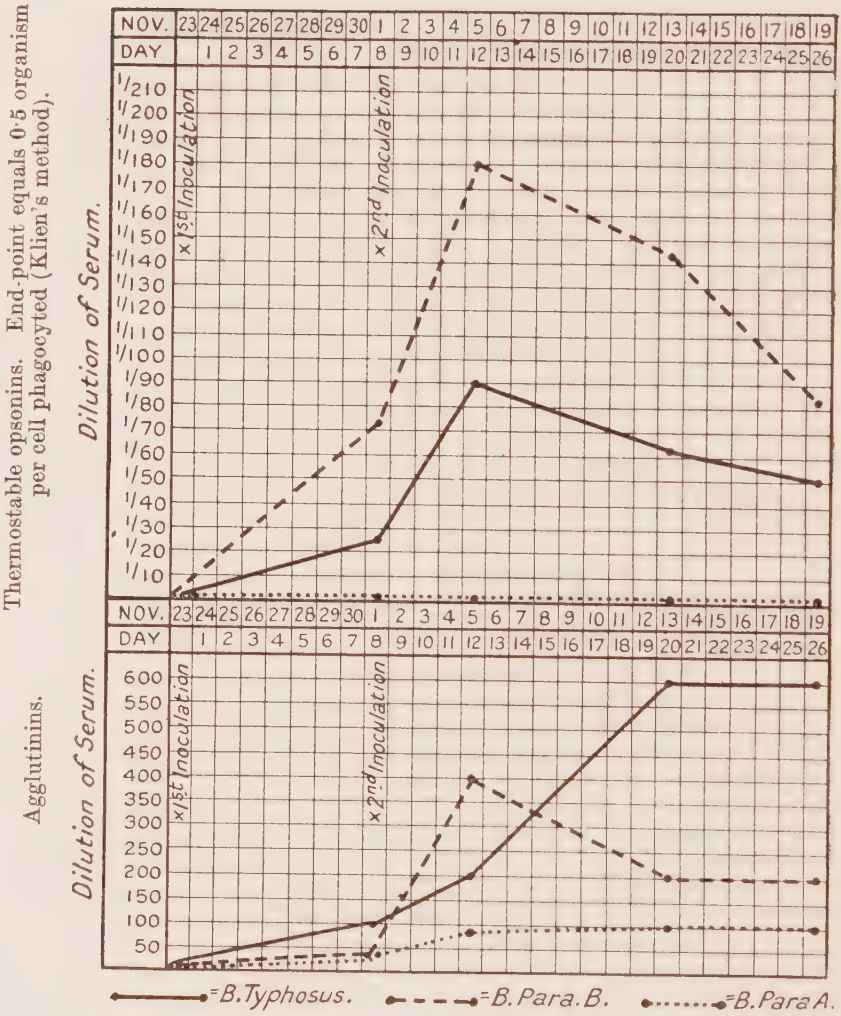

* Chart 2. The above represents the agglutinin and thermostable opsonin curves of a man in Group D receiving two doses of a vaccine containing 1,000 million *B. typhosus*, 500 million Para. A, and 500 million Para. B per cubic centimetre. The opsonin content of the serum gave the same result as in the case of Chart I. *This man had a severe reaction after the first dose.* This was apparently due to the *B. typhosus* part of the vaccine, and is reflected in the opsonin curve.

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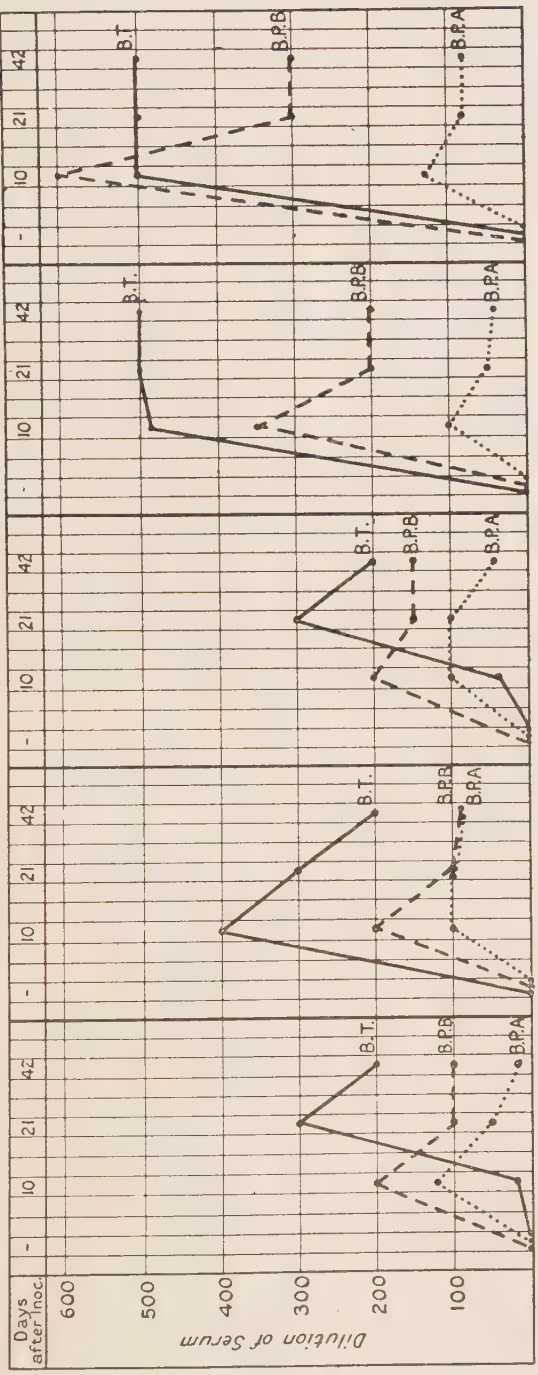
COPPINGER (C. J.) & GIBSON (H. G.). *Jl. Roy. Army Med. Corps.*] [*Trop. Dis. Bull.*

Agglutinins.



* Chart 3. The interval of 10, 21, and 42 days indicates the number of days after the single dose of 1 c.c. of the vaccine in the case of Groups A, B and C, in the case of Groups D and E the number of days after the second dose of vaccine. For the doses received by the different groups see the first paragraphs of this paper.

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MACLAREN (J. P.). **Anti-Typhoid Inoculation at Tokai Convict Prison.** —*S. African Med. Rec.* 1916. Jan. 8. Vol. 14. No. 1. pp. 9–12.

The prison at Tokai is used for sick coloured convicts from the Cape Province. Early in 1915 most of the inmates were removed to make room for European, rebel prisoners. "In April, five cases of enteric fever occurred within 18 days." The author procured "prophylactic typhoid-paratyphoid vaccine" from the Institute for Medical Research, Johannesburg. Inoculation was started on the 19th April. "The potency of [the] vaccine was 1,000 million bacilli per cc. and the treatment consisted of two doses, the first of 9 minims or ½ cc. and the second, 7 to 13 days after, of 18 minims, or 1 cc. injected under the skin at the insertion of the deltoid muscle." The inoculation was voluntary and the usual instructions were followed.

"Out of 201 field rebel (European) prisoners 155 submitted to first inoculation;" only 105 submitted to the second inoculation so that 90 out of 201 were unprotected. There were no troublesome results and "after the inoculation was completed" only two cases of enteric fever occurred, one of these "was not really a new case as later on it was established that he had been sickening from the fever before he was inoculated." Both these men were only partially protected. "Of the 105 who were inoculated twice none took enteric fever."

All the coloured convicts remaining in the gaol were inoculated "except eight cases with very grave heart disease, three with epilepsy, and one with dropsy." A list of diseases from which the inoculated convicts were suffering is given below :—

V. D. Heart, etc.	50
Syphilis	70
Gonorrhoea	30
Senility	25
Cripples	32
Hernia	9
Tuberculous.	
Phthisis Pulmonalis	3
Necrosis of Bone	2
Glands	1
Respiratory.	
Laryngitis	1
Bronchitis	2
Asthma	2
Pneumonia (old)	2
Debility	6
Favus	3
Weak-minded	5
Paralysis	2
Bright's Disease (Chr.)	2
Arterio-Sclerosis	2
Stricture of Urethra	3
Rheumatism	2
Haematuria	1
Cirrhosis of Liver	2
Loss of One Kidney	1
	258

Table showing Relation of Diarrhoea (D) and Constipation (C) to High Temperature and Gravity of Case.

	1st week.	2nd week.	3rd week.	4th week.	5th week.	6th week.	Case complicated by inflammation of Liver, from old malaria.
1 ..	T. high D.	T. high D. / T. low C	T. high D.	T. high D. / T. low C.	T. low C.	T. normal C.	Relapse in 2nd week, and in 3rd and 4th weeks, prostration so grave and hectic that recovery despaired of.
2 ..	T. high D.	T. high D.	T. high D.	T. high C.	T. normal C.	T. normal C.	Terrible haemorrhages in 4th week; recovery miraculous, as he had also a double pneumonia. Only physique pulled him through.
3 ..	T. high C.	T. high C.	T. high C.	T. normal C.	T. normal C.	T. normal C.	Longest maintained temperature and highest evening rise—three degrees daily; yet never seemed distressed; uninterrupted daily fall till normal reached.
4 ..	T. high D.	T. high D. / T. low C.	T. normal C.	T. normal C.	T. normal C.	T. normal C.	Mildest case; never "oppressed."
5 ..	T. high C.	T. high D.	T. low C.	T. high C.	T. high C.	T. normal C.	Two injections of anti-typhoid vaccine; relapse in 5th week; small haemorrhages 21st day, but never deemed dangerous.
6 ..	T. high C.	T. low D.	T. high C.	T. high C.	T. low C.	T. low C.	One injection; relapse in 4th week, but never deemed dangerous.
COLOURED 7 ..	T. high D.	T. high D.	T. normal D.	T. normal D.	T. normal D.	T. normal D.	Greatest prostration of all; lay as if moribund for a fortnight; his recovery like a "resurrection."
8	very T. high C.	T. high C.	T. normal C.	T. normal C.	T. normal C.	T. normal C.	Highest temperature of all at first; but made quickest recovery. This case came from outside prison, with temperature over 105, on the evening after admission.

From this it will be clearly seen that the constipation cases did best, and the diarrhoea worst, *e.g.*: 1, 2, 7.

Dr. Maclaren writes :—

"The list will be of great interest, I think, to the profession here, as the records hitherto of inoculations are amongst soldiers or volunteers, who are presumably in good health. It will show more conclusively than anything else could how harmless the inoculation is."

In addition to the 258 included in the above list 407 hard labour, coloured convicts were inoculated with no bad results, "no case having even been taken into hospital."

Three of the cases were very severe but all recovered. To show that "vaccination done after [infection] will not stop the disease" a case is given in detail :—

"Case No. 5 reported sick nine days after a first inoculation, and, after consultation, was given a second injection of vaccine the day after admission, *i.e.*, ten days after first inoculation, as there was a hope that it might not prove enteric fever. But the sequel proved that it was, and that the disease had got the start of the injections. . . . They certainly did not cut short the disease. His temperature did not become normal till the twenty-first day, and on the twenty-fourth he developed a severe relapse, the temperature rising to 104·5° F., and not becoming normal again till the forty-second day, when he went straight on to recovery."

J. H. T. W.

SCHWARZ (L.). **Ueber die Typhusschutzimpfung der Kaiserlichen Schutztruppe für Deutsch-Südwestafrika.** [Protective Anti-Typhoid Inoculation of Troops in German South-west Africa.]—*München Med. Woch.* 1916. May 16. Vol. 63. No. 20. pp. 726–727.

The work recorded was done during mobilization in 1914. Six different strains of typhoid bacilli were used and 1 cc. contained 400 million with 0·5 per cent phenol—2,700 million were given in five doses as follows :—

(1) 0·25 cc.; (2) 0·5 cc.; (3) 1 cc.; (4) 2 cc.; (5) 3 cc.

The intervals between the injections were generally six or seven days. As it was not possible in every case to keep strictly to these intervals, where 14 days had elapsed after an inoculation the next dose was not increased but the last dose was repeated. There was no marked general or local reaction although redness and some pain occurred at the site of inoculation. In a series of protected men, 8 to 14 days after the last injection, the agglutination reaction was determined against living *B. typhosus*. In one case the titre was 1 in 1,600. In most of the cases it was between 1 : 200 and 1 : 800. In one case the titre reached only 1 : 50. In several men a reaction equal to 1 : 100 was observed about five months after the last injection. Many of those who received the protective vaccine were attacked by typhoid fever at various periods after the date of inoculation. Among 180 cases observed by the author there were no deaths, while there was a high mortality among the unprotected. Some of the people mobilized as Protectorate troops who had suffered from typhoid during the previous ten years were not inoculated. Some of these persons are reported to have suffered from typhoid fever. The author thinks that acquired immunity is lost sooner in hot climates owing to excessive cutaneous metabolism [*erheblichen Hautstoffwechsel*].

J. H. T. W.

CHANG CHIA-PIN. **Ueber das agglutinatorische Verhalten der Sera von gesunden (bzw. nicht an Typhus oder Paratyphus leidenden) Chinesen gegenüber Typhus- und Paratyphusbacillen.** [The Agglutinating Property of the Sera of Healthy Chinese (that is not suffering from Typhoid or Paratyphoid) towards Typhoid and Paratyphoid Bacilli.]—*Centralbl. f. Bakt.* 1. Abt. Orig. 1916. Mar. 22. Vol. 77. No. 5/6. pp. 435–440.

This is a series of experiments dealing with the agglutinating reaction of the sera of healthy Chinese (not suffering from typhoid or paratyphoid fever) towards typhoid and paratyphoid bacilli. The work has been done by a Chinese student of medicine in the German Medical School for Chinese in Shanghai. Fifty sera were tested against *B. typhosus* and of these only ten are noted as " gesund " (healthy). The others from whom serum was taken suffered from various diseases and injuries, such as " Syphilis," " Malaria," " ? Fever," " Fracture of the Radius," etc.—1 : 10 is the most common figure in the " table " given ; a few cases rose to 1 : 30 and one case to 1 : 40.

The second " table " records 50 examples of serum, taken from the same classes of individuals, and tested against *B. paratyphosus* B. Here again the highest titre is 1 : 40 and the most common titre is 1 : 10.

It will thus be seen that the serum of the Chinese has the same power of reaction as that of other races. The author gives a full Bibliography.

J. H. T. W.

ŠVESTKA (Vlad.). **Beitrag zur Epidemiologie der Paratyphus A-Infektion.**—*Wien. Klin. Woch.* 1916. Apr. 20. Vol. 29. No. 16. pp. 480–481.

This paper is " A contribution to the epidemiology of paratyphoid A-infection " as observed among Austrian troops on the Eastern battle-front. The author notes that previous to the present world-war infection by *B. paratyphosus* A was seldom seen in Europe and little was known of this type of paratyphoid fever. With the war and its consequences the disease was introduced into certain parts of Germany and Austria. During a period of three months the author was able to study 13 cases, occurring among troops that had been fighting in East Galicia. Twenty-seven cases recorded by SCHMITZ and KIRSCHNER (*Munchener medizinische Wochenschrift* 1916, No. 1) came from the same locality. From the cases under his care the author was able to isolate *B. paratyphosus* A :—Seven times by blood culture in ox bile ; five times from the stools and once from the urine. The strains of bacilli reacted in certain media as follows :—

" Plating," Endo's method.	" Plating," Drigalski.	Milk.	Glucose.
Small, transparent rose colonies.	Small bluish colonies.	0	No gas formation, except with one strain where a stab-culture in glucose agar showed slight gas formation.

The bacilli agglutinated with serum supplied by the Serotherapeutic Institute, Vienna from 1 : 3000 often up to 1 : 12000. There was no coagglutination either with *B. typhosus* or with *B. paratyphosus* B.

With serum taken from the author's patients and paratyphoid A bacilli the Gruber-Widal reaction was either negative or very slight, although similar bacilli were present in the blood, stools and urine of these patients [for absence of antibody in paratyphoid A fever compare "COPPINGER and GIBSON," this number, p. 91].

It is the author's opinion, supported by that of other observers, that :—

"Paratyphoid A is especially a disease of warm countries. In Dutch India, Ceylon and such regions it is common. It has apparently been brought to us by Russian troops coming from southern regions of the Russian Empire. I can in this connection remember that four years ago, when I was travelling in the Crimea and Caucasus a doctor in Odessa drew my attention to the relative frequency of this disease in the area near the Black Sea.

"The possibility of infection by paratyphosus A, especially in military stations, must be reviewed, and the usual research material (blood, stools and urine) be examined, both among the sick and among the convalescents, for *B. paratyphosus* A."

J. H. T. W.

HALLINAM (J. J.) & ROAF (H. E.). **The Incubation Period of Paratyphoid B Fever.**—*Brit. Med. Jl.* 1916. June 24. p. 885.

In the case described *B. paratyphosus* B was found in the stools some time before the onset of the disease. Admitted to hospital on September 23rd, 1915, the patient was supposed to be suffering from dysentery. Examination of the stools disclosed the presence of *B. paratyphosus* B. A microscopic serum test was negative. On October 5th the patient's temperature began to rise and on October 7th the bacillus was isolated from his blood. On October 25th a further serum test gave agglutination in a dilution of 1 in 1,000. The authors' conclusion is that "this case shows that *Bacillus paratyphosus* B can be present in the intestine at least twelve days before the onset of the fever and that cases which develop in hospital are not necessarily infected in hospital."

The Enterica group of bacilli may exist in the intestines of "carriers" for months and are found in apparently healthy people. The Coli-dysentery-enteric bacteria may become virulent under conditions not fully understood, but which seem to be accompanied by some chemical substance which causes the urine to react to the "diazo" test [v. *Indian Medical Gazette*, 1893, June].

J. H. T. W.

DUDLEY (S. F.). **Note on a Typhoid Carrier.**—*Lancet.* 1916. Apr. 29. p. 914.

An interesting note showing the danger of the "carrier" and persistence of infection. Previous to April 1911 H.M.S. "Formidable" was free from typhoid. Between that time and March 1914, 28 cases occurred. Other ships, serving under similar conditions, were free from the disease. Sanitation, food and water supplies were investigated and found free from suspicion. A carrier was sought for among men serving on the ship before April 1911 and among men who had

suffered from typhoid. The first investigation gave no *B. typhosus*, but one man gave a positive Widal reaction. He was re-examined three times and on the third occasion the bacillus was found in his faeces. In October 1898 the man was admitted to the R.N. Hospital, Chatham, suffering from typhoid fever. Being a ship's cooper his work brought him in contact with food when casks are opened and rations served out to the crews. The following table is given by Staff-Surgeon Dudley showing ships on which the man served and the cases of enteric fever that occurred while he was in them.

Table compiled from the Journals of the Various Ships.

Ship.	Date of Joining.	Place where serving.	Cases of Typhoid.	Died.
Pembroke ..	June 15th 1898	Home	—	?
Orlando	Feb. 15th 1899	China	2	?
Pembroke ..	July 26th 1902	Home	5 (12)	?
Immortalité ..	Aug. 27th 1903	Home	1	1
Endymion ..	Jan. 18th 1905	Home	1	1
Albion	May 8th 1906	Channel	1	—
Majestic	Feb. 26th 1907	Home	2	?
Venerable ..	Jan. 7th 1908	Channel	4	?
Implacable ..	Feb. 2nd 1909	Atlantic	6	2
Pembroke ..	Apr. 1st, 1910	Home	2	?
Caesar	June 7th 1910	Home	1	?
Formidable ..	Apr. 4th 1911	Home	28	7
			53	11

Of the 12 cases in the "Pembroke" five occurred in the naval barracks where the carrier was living. On April 24th 1914 the man was sent to the Chatham hospital. While in hospital the urine was sterile and blood culture negative. Widal reaction positive to 1/150—*B. typhosus* at intervals; in 17 examinations, about every fourth day, the bacillus was found seven times. The man was invalided out of the service and the Medical Officer of Health of his district was informed.

J. H. T. W.

Worster-Drought (C.) & Kennedy (Alex. Mills). **Acute Urinary Infection with Paratyphoid B Bacillus.**—*Brit. Med. Jl.* 1916. May 6. pp. 649–650.

The chief features of this case are summarised by the authors as follows:—

1. Pyuria due to a pure infection with *B. paratyphosus* B.
2. The absence of the usual signs of paratyphoid fever.
3. The successful treatment with autogenous vaccine and hexamine.
4. The patient had not been abroad.

Private—aged 17, A.S.C., admitted to the Royal Herbert Hospital, Woolwich, December 31st, 1915. No previous illness and feeling well up to day before admission. The symptoms, stated briefly, were:—Difficult micturition with intense desire; a "shivery" feeling and

pain in the abdomen. Febrile conditions present, temperature 103° F. and pulse 112. Tenderness over bladder and much albumin in the urine. On January 1st there was incontinence and pus in the urine. On that day Hexamine gr. x, sodii acid. phosph. gr. xv, syr. aurantii ʒi, aq. ad. ℥½ was prescribed and given, three times daily, throughout the illness. *B. paratyphosus* B was recovered from the urine on January 3rd; it "agglutinated strongly only with a specific paratyphoid B agglutinating serum." It was again found in pure culture on January 10th. Blood culture was negative. The autogenous vaccine was given—50 millions—on January 11th. On January 13th the reaction of the patient's serum to his own bacillus was positive to 1 in 100. The patient was free from pain and felt better. On January 16th 100 millions of the vaccine were given and the amount of pus in the urine became greatly reduced. From January 7th to 15th the temperature rose to 101° F., about, in the evening and was normal in the mornings. From January 16th it was normal. The pulse "varied with the temperature."

"On January 18th no paratyphoid B or other organisms could be recovered from the urine and no pus cells were observed on microscopical examination. On January 20th tenderness over the bladder had disappeared, frequency of micturition had gone, and the patient felt quite well; a faint cloud of albumin only was present in the urine."

Doses of 250 and 500 million B bacilli were given with an interval of six days. There was slight local reaction to the dose of January 29th and the patient's serum agglutinated his own bacillus up to 1 in 400. From January 18th no bacilli were found in the urine. A final dose of vaccine, 1,500 millions, was given on February 24th and the patient, "perfectly well," left the hospital on March 10th. The faeces were examined several times after February 21st but no bacilli of the typhoid group were found. The spleen was not enlarged, there were no "spots," no vomiting, no early diarrhoea and only "slight headache," and the "shivery" feeling.

J. H. T. W.

Coles (Alfred C.). **An Easy and Rapid Method of doing Widal's Reaction for Typhoid.**—*Brit. Med. Jl.* 1916. May 13. p. 684.

1. With a grease pencil or piece of wax draw a line across the middle of two slides at right angles to their long axes.

2. Spread a thin film of the patient's blood on one half of each slide; when that is dry spread a film of blood from a person who has not had typhoid and has not been protectively inoculated against it, on the other half of each slide, as a control. Dry.

3. With platinum loop or pipette place a drop of emulsion of killed typhoid bacilli on the centre of each half of both slides and rub well over the film of blood. Do not pass from one half to the other without sterilizing the needle.

4. On one slide place a cover-glass on each half keeping them well separated by the mark of the grease pencil.

5. Place the other slide on a piece of wet blotting paper and cover with a Petri dish to prevent evaporation for fifteen to twenty minutes. Then dry over the flame and stain.

"Examine both halves of the first slide under a moderately low power. At the end of fifteen minutes (often much sooner) distinct clumps of

agglutinated bacilli will be seen, provided the case be one of typhoid or the blood of one who has been prophylactically inoculated with a typhoid vaccine, whilst on the other half, the control, the bacilli show no signs of clumping. The films, stained with Leishman or Giemsa's stain, will show on one half patches of agglutinated bacilli, whilst on the control half the typhoid bacilli are more or less uniformly spread over the film."

Emulsions of killed *B. paratyphosus* A, or *B. paratyphosus* B can be used for diagnosis in the same way. Leucocytosis, suggesting the absence of typhoid, can be determined when examining the stained films.

J. H. T. W.

TRILLET (A.) & FOUASSIER (M.). **Etude de quelques facteurs exerçant une influence sur la rapidité de l'évolution du B. typhique dans le lait.**—*C. R. Acad. Sci.* 1916. May 29. Vol. 162. No. 22. pp. 849–852.

In a previous Note (*C. R. Acad. Sci.* 1913, Vol. 156, p. 1936) the authors had shown that *B. typhosus* diluted in water or bouillon in minute doses such as would not be detected by bacteriological examination would, however, when introduced into milk proliferate more or less rapidly. Thus 1 cgm. of moist bacilli diluted to $\frac{1}{500.000.000}$ showed rapid growth, attaining infinity after about 24 hours' incubation at a temperature of 30° C. The present contribution has for object the enlargement of our knowledge of this question, under certain experimental conditions.

I. Sterilized milk was infected with one drop of an emulsion, freshly made, by scraping 5 mgm. from the surface of an agar culture and adding 10 cc. of sterilized water. Bouillon was similarly infected.

No.	Time.	Milk Col. per cc.	Bouillon Col. per cc.
1	After 5 minutes	> 4000	< 3000
2	,, 10 ,,	7000	3000
3	,, 20 ,,	8500	3000
4	,, 40 ,,	9000	3000
5	,, 1 hour	∞	3000

It was not until after 24 hours that any increase of colonies appeared in the bouillon.

II. The influence of acidification, such as may occur in milk from the presence of atmospheric germs, was studied. To exclude germs and to simplify the experiment known quantities of lactic acid were added to sterilized milk such as was used in all the experiments.

This milk was infected with *B. typhosus* and poured into separate tubes to which increasing amounts of lactic acid were added. The colonies were counted after one hour's contact at a temperature of 20° C.

No.	Lactic Acid.	Colonies per cc.
Control	None	10,000
1	$\frac{1}{2000}$	10,000
2	$\frac{1}{1000}$	10,000
3	$\frac{1}{400}$	10,000
4	$\frac{1}{200}$	9,000
5	$\frac{1}{120}$	8,500
6	$\frac{1}{80}$	150
7	$\frac{1}{50}$	80

Thus we see that when the dose of lactic acid is greater than 1 : 400 the acid inhibits the growth of *B. typhosus.* These results may be compared with those obtained with hydrochloric acid which is reported to kill the bacillus in similar strength.

III. Coagulation produced by rennet does not arrest the growth of *B. typhosus.* This the authors have shown by submitting several specimens of milk, previously infected with the bacillus, to rapid coagulation, obtained in 10 minutes at 40° C. by the addition of a small quantity of rennet. "After an hour, a period during which we had noticed a marked diminution of germs in the case of a similar coagulation with lactic acid which served as a control, we separated aseptically the whey from the clot and carried out a comparative infection." One example is given :—

Control milk without rennet.. ..	1,350 col. per cc.
Milk coagulated by rennet	
Coagulum	1,080 „ „
Whey	750 „ „
Total ..	1,830

IV. The removal of the cream and dilution of the milk do not seem to have any influence on the rapid development of *B. typhosus* if the added water is free from germs from outside.

V. "Our results relate only to sterilized milk but may be considered as applicable to ordinary milk. The factors which influence the infection of milk by *B. typhosus* with the rapid development that we have disclosed, depend on the amount of the seed and the degree of neutrality of the milk. These depend in their turn on the foreign germs enclosed in the milk which attack either the lactose with formation of lactic acid, or the casein with production of products of degradation the alkalinity of which reduces the precedent acidity, as we have shown (*Ann. de l'Institut Pasteur*, 1905, Apr.).

"There is further the important factor of vital concurrence ; upon this factor depends, as Duclaux has shown, the predominance or diminution of one of the varieties present."

J. H. T. W.

LEBOEUF (A.), BRAUN (P.) & BOUNAFOUS (J.). i. **Note sur un procédé d'hémoculture en bouillon citraté.**—*Arch. Méd. et Pharm. Milit.* 1916. Apr. Vol. 65. No. 4. pp. 597–600.

ii. **Action comparée du bacille d'Eberth du Paratyphique B et du Paratyphique A sur les milieux au citrate de soude. (Nouveau procédé de différenciation).**—*Ibid.* pp. 601–603.

These two contributions hang together and will be treated as one. The authors found that methods of blood culture, applicable in times of peace and in well equipped laboratories, must in times of war give way to methods of "necessity." They note that the best method of haemoculture for the "enteric" group of bacilli is that of CONRADI-KAYSER based on the triple findings that ox bile: (1) dissolves the red corpuscles; (2) checks coagulation of the blood; and (3) constitutes a good medium for the culture of Eberth's bacillus and the paratyphoid bacilli. It is also thought that the bile impedes the bactericidal action of the serum. Finding that ox bile could not be obtained in quantities sufficient for the work they had to do the authors tried to find a substitute. They note that LAFFORGUE, in order to obtain the same results as those given when bile is used, adds to 10 cc. of blood 0·1 cc. of a 20 per cent. solution of citrate of soda mixing, when centrifuged, 10 cc. of the blood with 50 to 100 cc. of bouillon. Having convinced themselves that a certain amount of citrate of soda in the bouillon did not hinder the growth of the "enteric" group of bacilli and thinking that the bactericidal action of the serum is not so strong as is generally supposed the authors began their experiments. They planted blood directly into citrated bouillon in the following proportions:—

Blood taken from a vein	2 cc.
Normal citrated bouillon	10 cc.
Solution of citrate of soda (10 per cent.) ..	½ cc.

The bouillon is sterilized after adding the citrate of soda; after which the blood is introduced into the tubes. Typhoid and paratyphoid bacilli grew well in this medium. A series of comparative tests with ox bile were made and the results are given in tabular form.

The only noticeable difference between the results given by the two methods is that growth is slightly slower in the citrated bouillon; one series may be quoted as an example of this feature:—

No.	Date.	In Bile.	In Citrated Bouillon.	Observations.
252	5th Aug.	+ 6th Aug.	+ 11th Aug.	Paratyphoid A
253	,,	—	+ 9th ,,	,, A
254	,,	+ 6th Aug.	+ 6th ,,	,, B
255	,,	+ 6th ,,	+ 9th ,,	,, B
256	,,	+ 6th ,,	—	Eberth
266	6th Aug.	+ 7th Aug.	+ 14th Aug.	Eberth
293	8th ,,	+ 9th ,,	+ 10th ,,	,,

"Examination of this table shows that in the majority of cases there is a delay of 24 hours in the citrated bouillon as compared with the bile; sometimes this delay is more marked (No. 252 = 5 days, No. 266 = 7 days).

"The interesting point about this technique is that it allows one to work with a medium of fixed composition, always ready in any quantity and in any place and in which species other than those of the Coli-Eberth group will grow."

While conducting the above experiments the authors noticed that in a certain number of their tubes coagulation occurred. "The coagulum appeared rapidly (24 to 42 hours) in certain cases, more slowly in others." When the tubes were examined those in which the phenomenon occurred were found to contain *B. typhosus* and *B. paratyphosus* B. In no instance was there any coagulation in tubes planted with *B. paratyphosus* A. [In the "table" giving the numerical results of the examination a slip, due to the pen or the printer, has had the result of putting "A" and "B" in the wrong places.] In certain control tubes containing citrated bouillon to which 2 cc. of blood from healthy individuals was added no change took place, no clot was formed. Hundreds of experiments subsequently confirmed these findings.

"We were thus naturally led to think that the Eberth and the Para B must attack the citrate of soda and set free new substances, perhaps capable of acting upon diagnostic bodies."

After trying other tests and colouring matter the authors fixed upon litmus as best serving their purpose. They added litmus to their "citrated bouillon" "so as to obtain in a tube of 20 mm. diameter a light-violet tint." After the addition of the tincture of litmus the bouillon was poured into smaller tubes which were sterilized. These tubes were inoculated with typhoid and paratyphoid bacilli and the results were as follows :—

B. typhosus.—"At the end of 24 hours the colour changed to rose-salmon, then, at the end of from 48 to 72 hours, changing to blue or losing all colour ; in the last case (which appeared to us the most frequent) at the end of some days the decolorized medium became blue, the tint commencing to show itself on the surface of the liquid gaining progressively the lower layers (phenomena of oxidation probably.)"

B. paratyphosus B. "After 24 hours veering to a dirty grey-rose, then, in one case or another, either turning directly to blue or losing all colour (here decolorization is almost constant) ; in the latter case at the end of some days the blue tint again appeared passing from the surface to the deeper layers as in the preceding experiment."

B. paratyphosus A. "At the end of 24 hours turning to rose-violet ; this colour is preserved indefinitely."

Out of about 800 differentiations only two failed to agree with the above results. These results were not produced where peptonized water with litmus and citrate of soda was used and this fact the authors consider of importance ; "it proves in fact, the necessity of the presence of natural albuminoids, not acted upon so as to simplify their molecules, such as are found in beef bouillon." J. H. T. W.

WALSH (J. H. Tull). **Enteric Fevers in the Tropics : A Point in Nomenclature.** [Correspondence.]—*Lancet.* 1916. July 8. p. 78.

Lt.-Col. Tull Walsh points out that if the "enteric fevers" are grouped under the word "enteric," the bacilli naturally fall into a genus "enterica" with : *Enterica typhosa* = *B. typhosus*, *E. mitis* = *B. paratyphosus* A, and *E. icteriformis* = *B. paratyphosus* B." He makes this suggestion with a view to attracting attention to the present unsatisfactory classification of the typhoid fevers and their respective causative agents. A. G. B.

RATHERY (F.) & MICHEL (R.). **Vaccinothérapie dans la fièvre paratyphoide B.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. Apr. 20. 3 ser. Vol. 32. No. 13–14. pp. 485–507. With 21 charts and 4 diagrams.

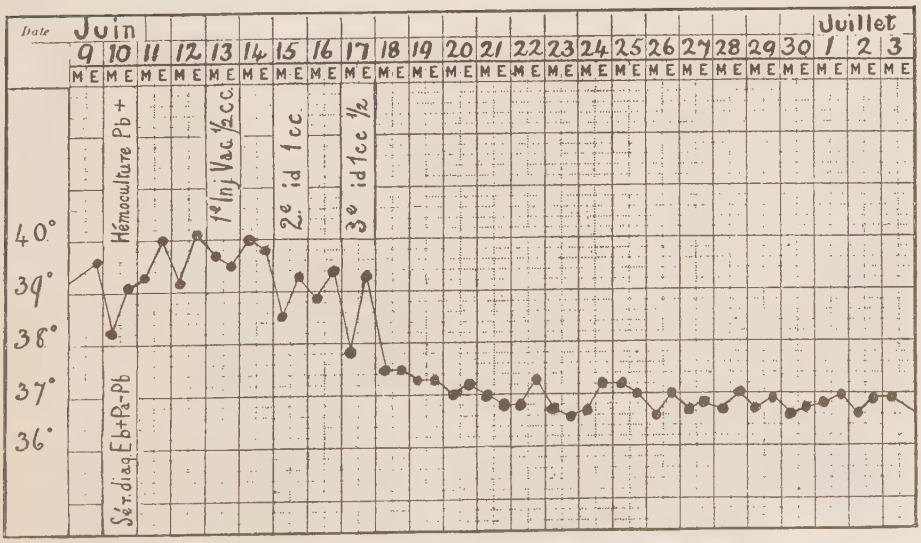
During the years of the war the authors have treated hundreds of cases of paratyphoid B fever. From the 1st December 1914 to the 14th April 1915, 693 cases passed through the Paris hospitals with which they are connected. These patients were treated in the usual manner with drugs, baths and sponging. The death-rate amounted to 8·80 per cent. and the epidemic was at its worst. From the 14th April 1915 to the 20th January 1916 their patients were treated with a paratyphoid B vaccine :—

Cases treated with " vaccine "	147	
Died	5	
Mortality	3·40	per cent.
Cases not treated with " vaccine "	279	
Died	6	
Mortality	2·15	per cent.

As explaining the low death-rate among the latter group the authors write :—" Towards the end of the epidemic we often observed cases of very mild type, severe cases were rare."

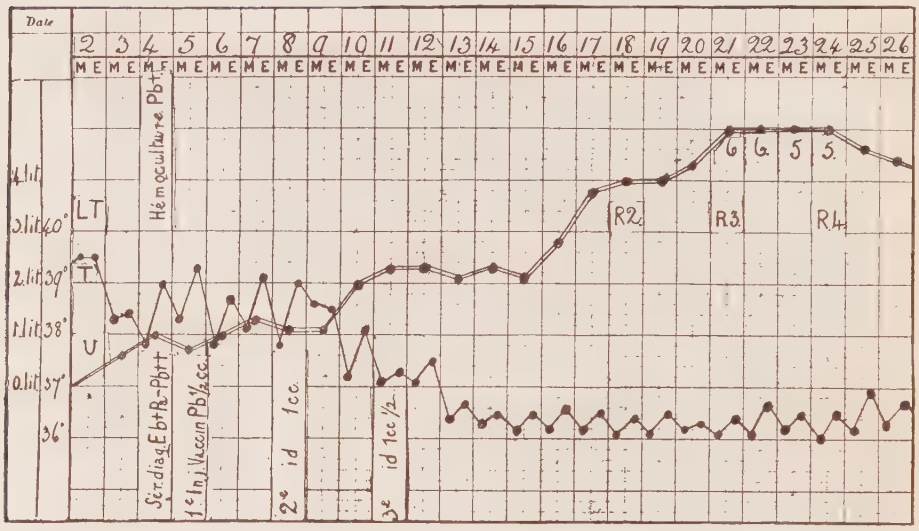
Mild cases were not treated with vaccine and others excluded were :— Cases seen at a late stage of illness ; those extremely feeble, and patients with much hypertrophy of the spleen, with anaemia, or coma. Cases with albuminuria or hyperpyrexia were not necessarily excluded. The results, as shown by the numerous charts, were good. The three charts given below are typical of the great majority.

CHART I.



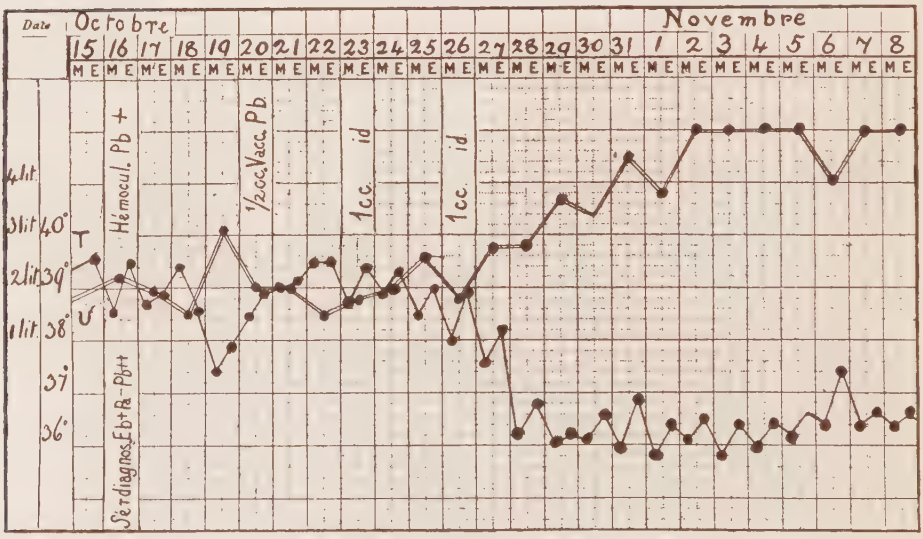
Observation 1. S., vaccinated four times against typhoid.

CHART II.



Observation 2. E., vaccinated four times against typhoid.

CHART III

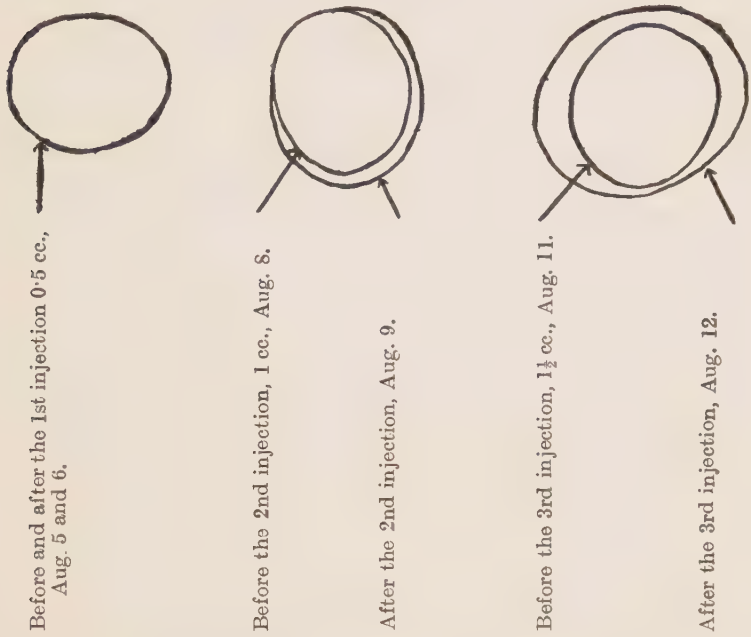


Observation 3. K., vaccinated once against typhoid.

Two of these charts show plainly the increased secretion of urine during " lysis " and convalescence.

It is of course well-known that the toxins formed by the " enterica " group of bacilli cause engorgement of the spleen, sometimes inflammatory and even followed by fibrotic hypertrophy. The authors

observed and noted the fact that the vaccine inoculations produced a rapid, more or less temporary, enlargement of the spleen. One of their diagrams is copied as an example of the phenomenon :—



It was noticed, as in the above case, that occasionally the first, and, generally small dose of vaccine, did not produce any measurable engorgement.

In a small number of cases the opsonic index was tested. The authors' conclusions in this matter are :—" In paratyphoid as in typhoid the opsonic index is relatively raised during the course of the disease ; if a first inoculation clearly lowers the ' index ' with a rise after the second inoculation it is wise to continue the vaccinotherapy."

J. H. T. W.

Bourges (Henri). **Syndrome anémique intense, brutal et passager, consecutif à une inoculation vaccinale antityphique chez un ancien paludéen.**—*Bull. Gen. de Thérap.* 1916. Apr. Year 85. Vol. 168. No. 20. pp. 838–843.

The case here recorded is that of a French sailor with a history of previous attacks of malarial fever. In 1907 he was in good health but during that year, while at Colon, he became infected with the malarial plasmodium. In 1910 he not only suffered from malarial fever but developed a large abscess in the liver for which an operation was performed at Havre. During 1911 the man had another attack of malarial fever. He recovered and was apparently in good health when, on the 14th August, 1915, he received an inoculation of anti-typhoid vaccine, amount not stated. During the night following there occurred a severe rigor, with high temperature, followed by profuse sweating. On the 16th the temperature was normal, but the sailor

was so pale and weak that he was at once removed to the marine hospital. The lungs appeared normal as was the heart except for some tachycardia. Pulse, 100; temperature, 36·2° C.; spleen and liver enlarged; urine free from sugar, albumin and bile salts. Any exertion caused dyspnoea and vertigo. A blood count showed :—

Red corpuscles	1,800,000
White ,, ...	17,000
Haemoglobin	3·5 per cent.

The condition of the patient remained much as described up to August 25th when some improvement was noticed. Organs apparently free from disease. Pulse, 80; temperature, 36·8° C. Blood count August 27th :—

Red corpuscles	2,692,000
White ,, ...	15,000
Haemoglobin	5·5 per cent.

The nucleated red cells, very numerous on August 16th, were no longer visible. By September the 10th the man was much better, colour had returned to the face and the liver was normal in size. Blood count September 24th :—

Red corpuscles	3,990,000
White ,, ...	9,300
Haemoglobin	9 per cent.

Spleen normal in size.

On September the 25th the man left hospital on sick leave.

[We must presume that malarial parasites were not found; the attack during the night of August 14–15 was not unlike an attack of ague. It is, however, more probable that the sudden septic poisoning had its origin in slumbering bacillary embers enclosed in the area formerly occupied by the liver abscess?

That previous attacks of malarial fever do not, as such, increase the possible danger of antityphoid vaccination appears to be proved by the absence of untoward effects following upon the vaccination of thousands of soldiers, British and Indian, sent from the Indian Empire to confront the enemy in various parts of the world.]

J. H. T. W.

AMOEBIASIS AND DYSENTERY.

Amoebiasis.

Ravaut (Paul) & Krolunitski (G.). **Pourquoi avons-nous failli méconnaître la dysenterie amibienne ?**—*Presse Méd.* 1916. Apr. Vol. 24. No. 22. pp. 169–172. With 2 text-figs.

This article consists largely of a reiteration of the authors' views previously expressed in other papers. One of the chief points is that *B. dysenteriae* may often be found in the stools of patients suffering from amoebic dysentery and in that case it always plays a secondary role and may even be saprophytic. If *B. dysenteriae* is isolated from the faeces, and the patient's blood agglutinates this organism, it does not necessarily follow that it is the cause of the illness. Very often *E. histolytica* is the real cause and this should always be suspected where anti-dysentery serum fails.

There are now many cases on record of amoebic dysentery being contracted in France by soldiers who have been in contact with colonial troops or their own countrymen, who have been abroad.

A somewhat detailed account is given of the morphology of *E. histolytica* together with the points of difference between it and *E. coli.*

E. E. A.

Orticoni (A.) & Ameuille (P.). **Sur la dysenterie amibienne autochtone.**—*Bull. Acad. Méd.* 1916. Apr. 4. Vol. 75. 3rd ser. pp. 390–392.

Of 28 cases of dysentery examined, 11 were amoebic. Three had lived in the colonies where they had had intestinal trouble, but eight had never been out of France. Five of these cases belonged to the metropolitan infantry, and the infection seems to have come from trenches and quarters previously occupied by colonial troops. For microscopical investigation absolutely fresh faeces are essential. Amoebic dysentery appears to have taken its place in the pathology of temperate climates. After the war we may expect to find the disease not only amongst soldiers returned from the front but also amongst the civil population.

E. E. A.

Worster-Drought (C.) & Rosewarne (D. D.). **Amoebic Dysentery in a Man who had never left England.**—*Brit. Med. Jl.* 1916. May 20. pp. 715–716.

An account of a soldier who developed dysentery with blood and mucus in the motions, although he had never left England. Active forms of *E. histolytica* were found in the stools. Treated with emetine this man completely recovered. No cysts were seen up to three weeks after his recovery. Several of his companions had been abroad but could not be proved to be infectious. The patient's serum gave no agglutination with Shiga or Y bacilli.

E. E. A.

Noc (F.). **Parasitisme intestinal en Cochinchine. (Diagnostic de l'amibiase intestinale chronique).**—*Bull. Soc. Path. Exot.* 1916. Mar. Vol. 9. No. 3. pp. 125–126.

In chronic amoebic dysentery the cysts may be difficult to find. Many cases are returned negative from insufficient time being spent over the examination, or an adequate number of examinations has not been carried out. To facilitate the search Noc has introduced the following procedure :—

1. Rectal wash of 500 cc. of boiled water.
2. Then a wash or instillation (lasting about 30 minutes) of the following solution :—

Thymol	0·5 gram.
Boiled water	1000 cc.

This treatment usually brings away a certain amount of mucus in which it is easy to demonstrate active forms of *E. histolytica.* It also has the additional advantage that it is directed against the nematode worm Trichocephalus. This worm has the same habitat as the amoebae and by its irritation of the intestinal mucosa may assist them to pass through the wall of the gut, so that it is very desirable to get rid of it.

E. E. A.

Thomson (J. Gordon) & Thomson (D.). **Some Observations on the Effect of Emetine Administration on the Free Vegetative Forms and Cysts of *Entamoeba histolytica* and *Entamoeba coli*.**—*Jl. Roy. Army Med. Corps.* 1916. June. Vol. 26. No. 6. pp. 683–694. With 1 plate.

In a series of 143 cases of definite amoebic dysentery, the typical four-nucleate cysts of *Entamoeba histolytica* were found in only 11 cases, and then only in small numbers. Cysts were not found during an acute attack of the disease. The morphology, more particularly the formation of cysts, of *E. histolytica* and *E. coli* is described.

The authors state that if a patient be treated with half-grain doses of emetine administered hypodermically twice daily until at least seven grains have been given, then neither Entamoebae nor cysts could be found in the faeces. Four cases of cyst carriers were observed and treated. Magnesium sulphate was given regularly at the same time in order to expel the cysts from the bowels. Cysts of *E. histolytica* were kept for sixteen days in a test-tube in a mass of solid moist faeces. Cysts of *E. coli*, kept similarly, were found to be in good preservation after a week. Cysts seemed to disappear sooner from very fluid stools. The authors briefly discuss the methods of infection in amoebic dysentery.

Their conclusions are as follows :—

"(1) If an amoebic case receive a continuous course of treatment with emetine of not less than a total of seven to ten grains of the drug administered in grain doses daily for a week, it is probable that he will never become a carrier of cysts. In order, however, to make certain of this, it is better to carry the treatment further. Such treatment also prevents relapses.

"(2) Cysts of *E. histolytica* can be cleared out of a patient after six grains of emetine, but, to make absolutely certain of this, it is better to exceed this dose. This treatment must be combined with saline purgatives, so as to get free daily action of the bowels.

"(3) A case of amoebic dysentery inefficiently treated with less than seven grains of emetine is likely to become highly dangerous as a carrier of cysts. One or two small doses may act beneficially and get rid of active symptoms, such as the passage of blood and mucus, but it may at the same time stimulate the formation of large numbers of cysts. The cessation of treatment on the disappearance of active symptoms is fraught with danger, both to the patient and, subsequently, to others.

"(4) All patients known to have blood and mucus in their stools and to have received less than an efficient total quantity of emetine ought to be examined for the presence of cysts in the faeces, as it is highly probable they have thereby become dangerous carriers.

"(5) The transmission of amoebic dysentery is undoubtedly due to the ingestion of cysts. This is brought about by the contamination of food, fingers, or flies. Cysts may also be carried along with sand particles by wind.

"(6) The powers of resistance of cysts outside the body are considerable, and this should be borne in mind by all responsible for sanitary prophylactic measures against dysentery."

H. B. F.

Noc (F.). **Amibiase intestinale, émétine, novarsénobenzol.**—*Bull. Soc. Path. Exot.* 1916. May. Vol. 9. No. 5. pp. 325–340.

Salvarsan is not the veritable specific for chronic amoebic dysentery that some authors have claimed it to be. It is most effective in combating infections of recent date. Against resistant strains of *E. histolytica* it is of little use. Given in conjunction with emetine its tonic action on the system may be quite beneficial, but it is a mistake to think it can replace this drug.

E. E. A.

Valencia (M. A.). **Tratamiento de la disenteria amibiana con neosalvarsan.** [Treatment of Amoebic Dysentery with Neosalvarsan.]—*Repert. de Med. y Cirug.* 1916. Mar. Vol. 7. No. 6. (No. 78). pp. 260–262.

Notes of the case of a man suffering from amoebic dysentery who had received 40 doses of emetine without much benefit, the quantities having been insufficient and the administration irregular. The patient, believing that his ailment was due to syphilis, applied to the author for treatment with neosalvarsan. A dose of 45 centigrammes was given, with the result that, the same night, the patient slept for six hours without waking, although, as a rule, he had from 8 to 10 motions in the course of a night. The appetite and general condition began at once to improve, and six days afterwards a second injection of 60 centigrammes was given. The stools were then reduced to two only in the 24 hours. The patient would not continue the treatment longer, believing himself cured. The author, however, met him afterwards in the street, and ascertained that he continued in a fairly good state of health. The case is reported as an encouragement to other practitioners.

J. B. N.

Allan (William). **Clinical Notes on the Use of Alcresta Ipecac in Amebic Dysentery.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1916. May. Vol. 3. No. 11. pp. 602–606.

It would be much more convenient if instead of injections of emetine, we could administer the drug by the mouth with equal efficacy, in

cases of amoebic dysentery. This would free the patient from the necessity of coming to the physician for each dose, as well as from the discomfort often arising upon repeated subcutaneous or intramuscular injections. A preparation has been placed on the American market named "Alcresta Ipecac Tablets," which consists of ipecac alkaloids compounded with hydrated aluminium silicate (Fuller's earth). As the result of observations on 10 cases the author declares that the results are unsatisfactory on account of the variation in absorption from the intestinal tract and he winds up by saying that emetine given hypodermically is twice as efficacious as emetine given in the form of Alcresta tablets.

E. E. A.

NIXON (P. I.). **Chaparro amargosa in the Treatment of Amebic Dysentery.**—*Jl. Amer. Med. Assoc.* 1916. Mar. 25. Vol. 66. No. 13. p. 946.

In previous communications the author has advocated the use of fresh infusions of Chaparro amargosa by the mouth for amoebic dysentery [see this *Bulletin*, Vol. 6, p. 51]. Several authors have experienced failure with emetine in a small residuum of cases. Nixon has found such cases yield to the treatment with the drug under notice. The present communication deals with such a case. Emetine was given in half grain doses subcutaneously every day for over four months. After an interval of two months, one grain of emetine was injected every other day for 40 days. This treatment did not kill the amoebae, for active forms were found in a stool consisting almost entirely of blood and tenacious mucus. After a preliminary dose of Epsom salts a glass of fresh infusion of Chaparro amargosa was given by the mouth four times daily, and a quart of the same infusion was put into the rectum. Improvement was only slight. With the object of getting rid of the tenacious mucus a preliminary rectal irrigation of sodium bicarbonate, 1 oz. to the quart was tried before the infusion. The patient soon got well with this treatment.

E. E. A.

DOPTER (Ch.). **Action de l'émétine dans le traitement des abcès amibiens du foie.**—*Paris Méd.* 1916. Mar. 4. Vol. 6. No. 10. pp. 243–252. With 4 text-figs and 1 chart.

The author has recently treated 11 cases of liver abscess due to *E. histolytica* with emetine. A litre of chocolate-coloured pus was evacuated from the first case on opening the abscess. Emetine was injected the same day. The discharge of pus rapidly ceased, losing the brownish colour almost immediately. This is very different to what is seen in cases not treated with emetine where the discharge of pus often drags on for several weeks. In another case the abscess discharged itself by bursting into the bronchi. Emetine produced a speedy recovery in 12 days. From another abscess 500 cc. pus were removed by aspiration, no operation being performed. Emetine injections produced a similar good result. Washing out the abscess cavity with a solution containing emetine, as recommended by ROGERS, is not necessary.

It is important to know whether emetine alone, without an operation, will effect a cure. A case of liver abscess was put on emetine. There was some improvement, but the liver still remained large and it became necessary to evacuate. On aspirating, 300 cc. pus were obtained which was greyish not chocolate in colour. In the second case eight punctures were negative as regards pus. The patient was put on 1·2 grs. emetine daily for 12 days. The temperature returned to normal in five days, the hepatic pain diminished, and the liver became smaller. Suddenly the patient brought up thick pus, grey at first, then green. Complete recovery ensued. Dopter is convinced that evacuation of these abscesses is absolutely necessary. The emetine converts the abscess into a " dead " one, that is to say it kills the amoeba and prevents the further production of pus, but is powerless to effect the absorption of the pus already formed. A few cases in which emetine was not successful are cited.

E. E. A.

Duggan (C. W.). **Osmosis in the Treatment of Tropical Abscess of Liver.** [Correspondence.]—*Jl. Roy. Army Med. Corps.* 1916. June. Vol. 26. No. 6. p. 824.

A note suggesting the following treatment of tropical liver abscess. After evacuation the cavity is washed out night and morning with 2 or 3 drachms of 10 per cent. ichthyol in glycerine. [Most authors consider evacuation combined with subcutaneous injections of emetine to be sufficient treatment.]

E. E. A.

Rathery (F.) & Bisch (L.). **Abcès du foie et diarrhée des tranchées.** —*Bull. Acad. Méd.* 1916. Apr. 4. Vol. 80. No. 14. pp. 388–389.

The disease known as " trench diarrhoea " is mostly of dysenteric origin as is proved by the fact that some of the patients develop liver abscess. The authors record four such cases, in which the clinical picture was that of ordinary dysenteric colitis that had persisted for two to four months. Operation cured the patients. Although ill for a few months they had continued to inhabit the trenches, suffering only from rather frequent slimy stools. Amoebae were not found in the faeces of these patients.

E. E. A.

Thomson (J. Gordon) & Thomson (D.). **Memorandum on the Prevention of Amoebic Dysentery.**—*Brit. Med. Jl.* 1916. June 24. pp. 881–882.

It is very important to give every case of amoebic dysentery a thorough course of emetine, to prevent the patient becoming a carrier. Short courses, such as grain doses daily for four days, benefit the patient's condition at the time but are dangerous as they often leave him a cyst carrier. He is then a potential source of infection, and may himself at any time develop a liver abscess. Daily grain doses should be given until 7 or 10 or even 20 grains have been taken. It is most important that there should be no intermissions ; missing a day or two here and there must be strenuously avoided. In the case of cyst

carriers 12 grs. at least should be given. They can usually be cured by giving magnesium sulphate in 2 drachm doses every four hours in conjunction with emetine.

The authors state they have found that flies can become infected with *E. histolytica* cysts, and deposit them in their faeces on food. The cysts can live for considerably over a month in faeces which are not allowed to dry. In faeces well diluted with fresh drinking water they persist for weeks. There is a special danger in Egypt from the natives' habit of depositing faeces in the open, on sand. Flies, water, and wind may aid in the spread of the infection.

A number of common-sense recommendations are submitted, based on the foregoing facts :—

1. *Thorough and Rapid Disposal of Faeces.* Either fly-proof latrines or kerosene in the buckets should be provided. Kerosene keeps flies at a distance and being inflammable assists in the incineration of the faeces later on.

2. *Thorough and Rapid Disposal of Horse Dung and Refuse.* Flies breed in manure, so this should not be allowed to lie.

3. *Separation of Camps from Native Quarters and Horse Lines.*

4. *Careful Guard of all Water Supplies.*

5. *Fly-screening and Destruction of Flies.* Especially in messes, canteens and cook-houses.

6. *Supply of Sterile Sand for Cleaning Mess Tins.* This is on account of the great liability of sand to be contaminated by the deposit of faeces.

7. *Eating and Drinking in Native Quarters.* No raw food should be eaten since the natives live under such unhygienic conditions. All water and milk should be boiled.

8. *Recommendations with regard to Hospitals.*

9. *Early Thorough Emetine Treatment.* This is administered on the lines indicated above.

10. *Microscopic Examination of Faeces before Discharge.* Patients should not be discharged for duty until free from infection.

11. *Isolation and Thorough Treatment of Cyst Carriers.*

12. *Examination of all Cooks and Mess-Room Orderlies.* No soldier should be employed as a cook or mess-room orderly in a camp or hospital until it has been proved by microscopic examination that he is not a cyst carrier.

13. *Larger Sanitary Staff and Equipment.* If larger sanitary squads and equipment could be provided, these measures could be carried out, and the disease would rapidly disappear from our army. The extra expense would be repaid almost immediately.

E. E. A.

PENFOLD (W. J.), WOODCOCK (H. M.) & DREW (A. H.). **The Excystation of *Entamoeba histolytica* (*tetragena*) as an Indication of the Vitality of the Cysts.**—*Brit. Med. Jl.* 1916. May 20. pp. 714–715. With 8 figs.

Kittens were found by feeding to be refractory to cysts of *Entamoeba histolytica*, only one out of twelve becoming infected in three weeks. Hence the authors tried to cultivate the cysts. "A sample of faeces containing a good infection with cysts is well emulsified with saline

(or water) and filtered through three or four layers of fine gauze, to remove the larger faecal particles. The filtrate is then centrifugalized and the deposit washed three or four times, the supernatant liquid, which contains large numbers of bacteria but no cysts, being pipetted off each time. By this means toxic products are removed, and the cysts are concentrated in a mass of fine faecal débris."

Pancreatic extract was found to be the only successful agent in producing excystation. The authors' method is thus described :—"A mixture is made up in the following proportions: Nutrient broth five parts, liquor pancreaticus two (or three), cyst-containing sediment one part. This mixture is then incubated for five to seven hours at 37° C. At the same time a drop of the mixture is placed on a slide, covered, and the cover-slip ringed to prevent evaporation; this is also incubated. This observation-preparation serves as a control to the tube and can be taken out and rapidly examined whenever desired, to ascertain how excystation is progressing; after five or six hours excystation is usually taking place." During the process, the protoplasm slightly retracts from the cyst membrane and becomes somewhat amoeboid. Dissolution of the membrane occurs over a small area. A small, mainly ectoplasmic protuberance of the amoeba is thrust through the aperture. The process of emergence may take only 10 minutes or it may take longer. The authors do not consider that a division into four amoebulae takes place, as a rule, within the cyst. Chromidial blocks may or may not be seen in excysted amoebae.

Subcultures were made from excysted amoebae in "the expression-liquid of blood-agar tubes, to which either two parts of citrated blood or equal parts of citrated blood and fresh serum were added. These new tubes were then placed in a vacuum and incubated at 37° C. At from eighteen to twenty hours after the excystation period we have seen both small and moderate-sized active *histolytica* forms in these cultures, a few of the larger individuals containing red blood cells." It is doubtful whether multiplication had occurred therein. The cultures became overgrown with bacteria.

The method outlined above fails with *Entamoeba coli* and with *Lamblia intestinalis.* The authors think that conjugation occurs within Lamblia cysts.

Experiments on the vitality of the cysts of *Entamoeba histolytica* were interrupted. Cysts were kept in slowly running water for fifteen days, and some were found to be alive at the end of this period. Water contaminated with cyst-containing faeces may remain a source of infection for a long time.

H. B. F.

Job (E.) & Hirtzmann (L.). **Le cycle évolutif de l'Amibe dysentérique.** —*C. R. Soc. Biol.* 1916. May 20. Vol. 79. No. 10. pp. 421–424. With 13 figs.

The observations were made on stools of patients suffering from amoebic dysentery in Morocco. The authors think that in the life-cycle of the amoeba of dysentery—called by them *Amoeba dysenteriae*—there is multiple schizogony and sporogony (involving sexual reproduction) as well as binary fission.

The schizonts are said to measure 8μ to 9μ, and to contain a variable number of chromatinic granules. When these granules become very small the parent cytoplasm segregates around each of them, forming a morula stage. The daughter organisms, thus formed, when free measure 2μ to 4μ.

In sporogony a uninucleate form is said to undergo peripheral nuclear reduction by budding, and thus to lead to the typical *Entamoeba histolytica* (or *A. dysenteriae* of the authors), which is thought to be a mature female gamete.

Other amoebae, in which nuclei of different types were present, have been observed, but no conjugation was seen. It is thought that further nuclear reduction occurs before the typical four-nucleate cystic stage is reached. Stages of schizogony and of sporogony are illustrated in the text-figures.

[Some of the authors' figures are somewhat reminiscent of Noc's Entamoeba and the early figures of Grassi.]

H. B. F.

i. Ward (A. B.), Coles (A. E.) & Friel (A. R.), **Infectious Jaundice.**—*Brit. Med. Jl.* 1916. Apr. 8. p. 526.

ii. Fantham (H. B.). **Amoebae in Urine in a Case of Infectious Jaundice.**—*Ibid.* Apr. 15. pp. 553–554.

i. Under this heading the authors draw attention to some peculiar bodies seen in the urine of a case of jaundice with albuminuria at Mudros. Under a low power yellow-greenish bodies were seen, circular or pear-shaped in outline and of markedly granular appearance. Under a sixth the nucleus was easily seen. The bodies varied from 8 to 33μ in diameter, averaging 20 to 25μ. The protrusion of a pseudopodium could be observed. No cystic forms were seen. The authors have named the organism provisionally *Amoeba urinae granulata.*

ii. Dr. Fantham draws attention to the organism named *Amoeba urogenitalis* (Baelz 1883) and similar cases reported since by Juergens, Kartulis, Posner and others. He suggests that the authors' provisional name seems hardly necessary.

A. G. B.

Mendel (Joseph). **Les Amibes de la bouche, à l'état normal et pathologique.**—*C. R. Soc. Biol.* 1916. May 6. Vol. 79. No. 9. pp. 393–394.

Entamoeba buccalis and *E. tetragena* [such are the species names used] are considered by the author to be closely allied morphologically. He remarks that only Chiavaro has seen cysts of *E. buccalis.* The author wonders whether there is any genetic relation between the two amoebae. He had 147 cases showing amoebae in the mouth, both normal and pathological. He found 85 per cent. of his patients were infected. Of these 55 per cent. were rich in amoebae. Among 36 children examined, 22 per cent. were infected. He notes that the toothbrush is useful in eliminating amoebae from the mouth.

Amoebiasis of the mouth was found to coincide almost always with a condition of hyperleucocytosis of the gingival exudate. Of 40 cases of pyorrhoea alveolaris, 38 showed amoebae, often in considerable numbers, and the amoebae were of the same kind as those found in

normal mouths. Chronic cases of certain alveolar abscesses, some cases of gingivostomatitis, and certain infections of the wisdom teeth always showed the presence of amoebae, but the parasites were absent from acute cases of these diseases. Amoebae were found in the mouths of patients having carious teeth, but the parasites were not found in the carious cavities, except in a single case where the cavity was large, contained food detritus and was continuous with the buccal cavity. However, in 15 cases of dental caries examined no amoebae were observed.

The author believes that oral entamoebae exercise no influence on the production of dental caries.

H. B. F.

Bacillary Dysentery.

Bertillon (Georges). **Une épidémie de dysenterie hémorrhagique dans un escadron de dragons.**—*Ann. Inst. Pasteur.* 1916. Mar. Vol. 30. No. 3. pp. 141–144.

d'Hérélle (F.). **Sur un bacille dysentérique atypique.**—*Ibid.* pp. 145–147.

These two papers form a clinical and bacteriological account, respectively, of a small epidemic of dysentery caused by an atypical dysentery bacillus. A dozen cases were affected, 10 of which were soldiers. The usual blood and slime was present in the stools. The only fatal case was a girl of 14 years. Neither anti-dysentery serum nor emetine gave good results. It was only possible to treat one of the patients with an autogenous vaccine. He was injected on three successive days and apparently benefitted by the inoculations. Flies seem to have been responsible for the spread of the disease. The latrines had been dug at a distance of 20 meters from the kitchens. Many flies passed directly from the dejecta to the food. As soon as the latrines were established at a greater distance, the epidemic ceased. The faeces of five of the patients were examined ; from each of which a type of dysentery bacillus was isolated different from any hitherto described. This organism was not agglutinated by a Shiga or Flexner serum, nor by a polyvalent serum made from Shiga, Flexner and Hiss strains. The serum of one of the patients at the beginning of convalescence did not agglutinate the bacillus. Its fermentation reactions are compared with those of its congeners in the following table :—

	Shiga.	Flexner.	Hiss.	Strong.	Gay.	d'Hérelle.
Indol	—	+	+	?	?	—
Lactose	—	—	—	—	—	—
Glucose	+	+	+	+	+	+
Mannite	—	+	+	+	+	+
Maltose	—	+	—	—	+	+
Saccharose	—	+	—	+	+	—
Agglut. Shiga serum	+	—	—	—	—	—
„ Flexner „	—	+	+	—	+	—
„ Hiss „	—	+	+	—	+	—
Pathogenic for animals.. ..	+	—	—	?	?	+

E. E. A.

BRUENAUER (Stefan Robert). **Ueber Allgemeininfektion mit Dysenteriebazillen.** [General Infection with Dysentery Bacilli.]—*Wien. Klin. Woch.* 1916. Feb. 3. Vol. 29. No. 5. pp. 128–130.

The clinical diagnosis of dysentery is considerably in advance of the bacteriological; of 849 cases of dysentery, only 54 were confirmed bacteriologically. This is much more in evidence than in the case of the typhoids and cholera. Of the causes brought forward to account for it, intermittent excretion of the bacilli in the faeces is the most important. Typhoid and paratyphoid bacilli are often found in the blood and occasionally in the urine, which lends an additional aid to diagnosis, but these findings are rare in dysentery.

Five cases are instanced. In two of them, which were typical dysentery, *B. dysenteriae* Flexner-Y was found in the urines. Cultures of the urine and faeces proved positive in another case, in which *B. paratyphosus* A was also isolated from the faeces. From the urine of a fourth case, a convalescent typhoid, the same organism was again recov red. Lastly *B. dysenteriae* Y was cultivated from the blood of a typhoid patient. In this instance, as is the rule in such cases of mixed infection, the clinical picture was that of typhoid fever.

E. E. A.

SELIGMANN (E.). **Zur Bakteriologie der Ruhr im Kriege.** [Bacteriology of Dysentery in the War.]—*München. Med. Woch.* 1916. Jan. 11. Vol. 63. No. 2. p. 68.

In a previous investigation, the results of the bacteriological examinations of the stools of dysentery and similar diseases were not satisfactory on account of the small percentage of positive findings. Since then the author has had the opportunity of examining cases early in the course of the disease. The cases were severe, mild and convalescent. Where possible particles of mucus were separated from the stools, thoroughly washed in salt solution, and spread over the surface of plates. *B. dysenteriae* Shiga was isolated in 38 per cent. of all the cases, the Flexner-Y type not being found. Of these positive findings :—

70	per cent.	were	found	in the	1st	week	of the	disease.
53	,,	,,	,,	,,	2nd	,,	,,	,,
18	,,	,,	,,	,,	3rd	,,	,,	,,
0	,,	,,	,,	,,	4th	,,	,,	,,

In a footnote it is stated that during a subsequent more extensive examination of convalescents a few cases were discovered harbouring the bacillus for a longer period.

From 30 per cent. of the autopsies Shiga was recovered, chiefly from the large intestine, but once from the small gut and twice from the stomach. In both of the last two cases gastritis was present, while one of the men had vomited blood. Dysentery bacilli could not be cultivated from the blood in any of the cases in which it was tried.

E. E. A.

VERZÁR (Fritz) & WESZECZKY (Oscar). **Ueber Bazillenträger bei Flexner-Dysenterie.** [Dysentery (Flexner) Carriers.]—*München. Med. Woch.* 1916. Feb. 22. Vol. 63. No. 8. pp. 291–292.

Among 417 cases of convalescent dysentery 77 carriers were discovered, of which 75 were due to *B. dysenteriae* Flexner. The faeces of these cases were not examined in the acute stage, and it is therefore likely that some of the diagnoses were incorrect, which would give a larger proportion of carriers still. From this it will be seen that Flexner carriers are quite common.

In an establishment containing 500 convalescents from various diseases, a small epidemic of dysentery arose comprising six cases, from three of which *B. dysenteriae* Flexner was obtained. As there were no cases in the town and the soldiers were completely isolated from the civil population, an examination of all the dysentery convalescents was undertaken with the result that three Flexner carriers were discovered. In addition all the soldiers who had come from the fighting line immediately before the first cases made their appearance were submitted to a similar investigation, one carrier being found. The interesting fact was now elicited that two of the acute cases had lain in beds adjacent to dysentery carriers. Two of the carriers were free from bacilli in about a couple of weeks (four negative examinations of the faeces). These were probably not carriers in the true sense, but more probably recently infected persons in whom the voiding of bacilli was only a passing event. The other two were much more persistent, one of them being a carrier for at least seven months after his attack of dysentery. This man seems to have been the source of the epidemic since the cases occurred soon after his arrival, while his isolation put an end to the epidemic. The authors draw attention to the intermittent passing of bacilli in the faeces. They have often had a positive finding after two negatives at intervals of at least five days.

E. E. A.

TEN BROECK (Carl) & NORBURY (Franz Garm). *B. dysenteriae* **as a Cause of Infectious Diarrhea in Infants.**—*Boston Med. & Surg. Jl.* 1916. June 1. Vol. 174. No. 22. pp. 785–788.

The stools of 75 infants with infectious diarrhoea were examined, from 51 of which dysentery bacilli of the mannite-fermenting type (Flexner-Y) were isolated. In five cases bacilli could only be obtained from the faeces at the autopsy. Even in typical cases of dysenteric diarrhoea the bacillus may be difficult to isolate as the following table shows :—

Examination at which *B. dysenteriae* was detected.	No. of cases.
1st	30
2nd	12
3rd	5
4th or subsequent	4
Autopsy, not during life	5

Positive agglutinations were obtained with several sera of infants whose stools did not show dysentery bacilli. Although the authors have previously found that the sugar fermentation reactions are not constant with the exception of glucose and mannite, they tested their strains and found 76 per cent. belonged to the Y group, 13 per cent. to the Flexner group, and 10 per cent. to the Strong group.

Morgan's bacillus No. 1 was present in the faeces of one case, but the patient's serum did not agglutinate this organism (1 : 20 dilution) though it did agglutinate dysentery bacilli (1 : 320 dilution).

E. E. A.

van Poole (G. M.). **An Epidemic of Dysentery at Fort Shafter, Hawaii, with Three Cases of the Hiss-Russell or "Y" Bacillus Infection.**—*Milit. Surgeon.* 1916. May. Vol. 38. No. 5. pp. 525–530.

Delaney (M. A.). **An Epidemic of Bacillary Dysentery due to the Hiss-Russell Bacillus.**—*Ibid.* pp. 531–533.

Foucar (F. H.). **Bacillary Dysentery, Recent Epidemic at Fort Shafter, H. T., from the Laboratory Aspect.**—*Ibid.* pp. 534–538.

Three slight contributions dealing with an epidemic of dysentery in the Sandwich Islands, caused by *B. dysenteriae* Y. Several children were attacked with fatal results. Inoculation of the healthy children with a vaccine prepared from the organism isolated completely aborted the epidemic as far as the children were concerned. Adults were not treated with the vaccine and a few cases continued to occur amongst them.

E. E. A.

Nègre (L.), Sergent (Ed.) & Foley (H.). **Le rôle des bacilles pseudodysentériques dans les affections intestinales en Algérie.**—*Bull. Soc. Path. Exot.* 1916. Apr. Vol. 9. No. 4. pp. 204–207.

The authors have isolated organisms, which they call pseudo-dysentery bacilli, from the faeces of patients suffering from diarrhoea, dysenteric or otherwise, in Algeria. The chief characteristics of these bacilli are :—

1. Fermentation of lactose and glucose with acid and gas production.
2. Most of the strains are non-motile.
3. They are not agglutinated by Shiga or Flexner serum. In many cases the patient's serum agglutinated the respective organism in a high dilution.

In two cases the coexistence of *E. histolytica* was noted.

E. E. A.

Chowaniec (Wanda). **Ein interessanter Fall von Dick- und Dünndarm-dysenterie.** [Interesting Case of Dysentery of the Large and Small Intestines.]—*Wien. Klin. Woch.* 1916. May 11. Vol. 29. No. 19. pp. 583–584.

A record of a case of severe clinical dysentery. Bacteriological investigation [? serum agglutination or isolation of bacillus from faeces] was positive for Shiga. Unspecific treatment with animal charcoal, bismuth, tannin intestinal injections was administered.

The case proved fatal, and the autopsy showed dysenteric ulceration of not only the large gut but also the small for a distance of about 30 feet from the ileo-caecal valve. [The administration of anti-dysentery serum in the early stages might have saved this man's life.]

E. E. A.

SCHARF (S.), SOKOLOWSKA (Helene) & GIESZCZYKIEWICZ (Marian). **Ueber die Serumbehandlung der Ruhr.** [Serum Treatment of Dysentery.]—*Med. Klinik.* 1916. Feb. 6. Vol. 12. No. 6. pp. 148–150.

During 1915, 305 cases of dysentery were treated with anti-dysentery serum, for the most part polyvalent, with only six deaths (2 per cent.). Of these fatal cases, however, three had no serum injections because the onset was atypical and the disease not diagnosed until it was too late. The other three died of complications. Only the severe cases got serum. The bacteriological analysis of the cases in one hospital was as follows :—

Shiga	84
Flexner-Y	50
Atypical	2
Not Identified	5
Not Investigated	6
No Pathogenic Bacteria found	58

If one dose of anti-serum does not suffice, it should be repeated daily until a good effect is produced.

E. E. A.

GENEESKUNDIG TIJDSCHRIFT VOOR NEDERLANDSCH-INDIË. 1916. Vol. 56. No. 1. pp. xxxiii–xxxvii.—**Verslag over de antwoorden, ingekomen op de rondvraag, toegezonden aan de leden der Vereeniging tot bevordering der Geneeskundige Wetenschappen in Nederl-Indië, omtrent den samenhang van den dood bij lijders aan bacillaire dysenterie in het reconvalescentie-stadium en de toediening van antidysenterieserum.** [Analysis of Replies sent in to the Circular distributed to the Members of the Society for the Promotion of Medical Science in the Dutch Indies, with Regard to the Connection between Death in Patients recovering from Bacillary Dysentery, and the Employment of Anti-dysenteric Serum.]

In response to a Government enquiry as to the occurrence of deaths amongst convalescents from bacillary dysentery who had been treated with antidysenteric serum, the above-named society sent out 500 circulars to its members asking for information on the subject. Only 157 replies were received, of which 116 were simply negative, while 41 entered into details. One member only reported a case of sudden death, eight days after a dose of 50 cc. of Pasteur serum. Several other members, however, reported deaths from heart failure in patients convalescent from dysentery, who had not received any injections of serum. On the whole, it seemed improbable that the use of serum had the drawback alleged, of causing sudden heart failure.

J. B. N.

TEDESKO (Fritz). **Ueber Mallosan bei Dysenterie.** [Mallosan in Dysentery.]—*Wien. Med. Woch.* 1916. Feb. 12. Vol. 66. No. 7. p. 274.

A note advocating the use of mallosan which is a preparation of peat, in cases of bacillary dysentery. It is given in the form of a biscuit or powder. The peat is blended with cocoa to make it more palatable. The action is similar to blood charcoal and like substances, that is to say, it forms a basis for the adsorption of toxins, but it is claimed that peat by virtue of its humic acid is much stronger in this effect. As many as ten biscuits may be given per diem [size or weight not mentioned].

E. E. A.

DEAN (H. R.) & ADAMSON (R. S.). **Preliminary Note on a Method for the Preparation of a Non-Toxic Dysentery Vaccine.**—*Brit. Med. Jl.* 1916. Apr. 29. pp. 611–614.

Inspired by the good results obtained with eusol by several authors in cases of toxaemia and septicaemia, Dean and Adamson have applied this method to the production of an atoxic *B. dysenteriae* Shiga vaccine. Eusol is a dilute solution of hypochlorous acid, and there is evidence to prove that this substance does not destroy bacterial antigens. Rabbits were first experimented upon. It was found that one in 1,000 eusol was the smallest concentration necessary to render the vaccine atoxic. By treating the bacilli in this manner rabbits could be immunised to withstand something like 10 lethal doses of dead Shiga bacilli. The agglutinins produced by these inoculated animals were decidedly small in amount—in some cases none at all. Similar good results were obtained by using hydrogen peroxide instead of eusol. As the ultimate object of these experiments was the application of the results to protective inoculation in the case of man, the authors proceeded to inject three persons. In each case constitutional symptoms were absent, while the local reaction was a trifle more marked than is usual with a typhoid vaccination. On the strength of these results the authors are led to recommend tentatively a vaccine containing 200 million Shiga bacilli per cc. killed at 58°–60° C. for an hour. This should be mixed with an equal bulk of freshly prepared eusol in normal saline and allowed to stand at room temperature for 24 hours. One cc. of this, which will contain 100 million bacilli in 1 in 1,000 eusol solution, should be injected subcutaneously for the first dose. The second dose given, say, 10 days later might contain 400 million bacilli. A third dose of 200 million or more killed by heat but without the addition of eusol may be required to produce a satisfactory immunity. It is pointed out that the basis of these recommendations is a rather limited number of experiments and further experience may suggest a revision in the direction of increasing the dose of bacilli and perhaps also the amount of eusol in the vaccine. The latter might be expected still further to reduce the tendency of a Shiga vaccine to produce a severe local reaction.

E. E. A.

THOMSON (J. D.). **Attempts to Produce a Safe and Effective Bacillus Dysenteriae (Shiga) Vaccine for Prophylactic Purposes.**—*Brit. Med. Jl.* 1916. Feb. 26. pp. 303–305.

This paper should be read in the original by those whom it concerns. All the experiments were performed on rabbits and therefore one must be guarded in applying the results to man. Local reactions are at a minimum in the case of rabbits, whereas they are a considerable obstacle to the employment of a Shiga vaccine in man, but as the author points out, this applies principally to its prophylactic use; observations on patients suffering from chronic dysentery who have been treated with vaccines, show that in their case the local reaction is quite trifling. It is better to use vaccines in carbolised saline (0·5 per cent. phenol) than those killed by heat. The immunity produced by sensitised and ordinary vaccines was about the same.

E. E. A.

RITCHIE (T. R.). **On the Agglutination Reaction of the Bacilli of the Typhoid-Dysentery Group with Normal Sera.**—*Lancet.* 1916. June 24. pp. 1257–1260.

This is an important paper in view of the number of normal people tested and the care taken to get a homogeneous population, or rather to include only those persons who are most unlikely to have come in contact with the infecting organisms in question. Some 800 sera were collected in Cambridge as follows:

Males.

Cambridge Undergraduates	294	
,, Scientific Instrument Company ..	108	
,, University Press; and Union Press ..	48	
Leys and Perse Schools	33	
Cambridgeshire Regiment	28	
Various sources	24	535

Females.

Newnham and Girton Colleges	251	
Various sources	6	257
Total		792

None of these to their knowledge had suffered from any of the diseases associated with the organisms tested. Foreigners and inoculated persons were excluded.

As regards the technique, the drop method of measurement was employed and each dilution mounted in a flat glass cell. These cells were placed on the top of one another in the incubator (37°) for two hours and then examined with the microscope. Living emulsions of 24 hour agar cultures in normal saline were used. This proved a very rapid method and the author found he could test 130 sera against five different organisms in a day of five hours.

Results :—

B. Typhosus.

TABLE I.—Showing Results obtained from the Examination of the Blood of 789 Normal Persons, excluding Medical Students, Laboratory Workers, and Hospital Patients.

—	— in 1 – 16	+ in 1 – 16	+ in 1 – 32	+ in 1 – 64	Total.
Females	229 = 89·45%	22 = 8·59%	5 = 1·95%	—	256
Males ..	504 = 94·56%	26 = 4·87%	2 = 0·18%	1	533
Total ..	733 = 92·9%	48 = 6·08%	7 = 0·88%	1 = 0·12%	789

B. paratyphosus A.

TABLE IV.—Showing Results obtained from the Examination of the Blood of 792 Normal Persons, excluding Hospital Patients, Medical Students, and Laboratory Workers.

—	— in 1 – 16	+ in 1 – 16	+ in 1 – 32	+ in 1 – 64	Total.
Females	245 = 95·33%	12 = 4·66%	—	—	257
Males ..	525 = 98·13%	9 = 1·68%	—	1 = 0·18%	535
Total ..	770 = 97·2%	21 = 2·63%	—	1 = 0·12%	792

B. paratyphosus B.

TABLE VII.—Showing Result of Examination of the Blood of 792 Normal Persons.

—	— in 1 – 16	+ in 1 – 16	+ in 1 – 32	+ in 1 – 64	Total.
Females	246 = 95·71%	11 = 4·28%	—	—	257
Males ..	513 = 95·88%	22 = 4·11%	—	—	535
Total ..	759 = 95·83%	33 = 4·16%	—	—	792

The conclusions drawn in each of these three cases is that complete agglutination in a 1 : 16 dilution should be regarded as suspicious ; in a 1 : 32 dilution as diagnostic.

B. dysenteriae Shiga.

TABLE X.—Showing Results obtained from Examination of the Blood of 792 Normal Persons.

—	— in 1–16	+ in 1–16	+ in 1–32	+ in 1–64	+ in 1–128	Total
Females	59=22·9%	65=25·29%	116=45·1%	15=5·8%	2=0·77%	257
Males	194=36·26%	194=36·26%	127=23·73%	13=2·4%	7=1·3%	535
Total	253=31·9%	259=32·7%	243=30·68%	28=3·5%	9=1·13%	792

Complete agglutination in a 1 : 64 dilution is to be looked upon as diagnostic.

B. dysenteriae Flexner.

TABLE XIII.—Showing Results of Examination of Blood of 792 Normal Persons.

—	— in 1–64	+ in 1–64	+ in 1–128	+ in 1–256	+ in 1–512	Total
Females	42=16·34%	84=32·68%	120=46·69%	7=2·72%	4=1·55%	257
Males	170=31·77%	243=45·42%	119=22·24%	2=0·37%	1=0·18%	535
Totals	212=26·76%	327=41·28%	239=30·17%	9=1·13%	5=0·65%	792

In accordance with the work of others the upper normal limit was found to be high. Agglutination in a dilution above 1 : 128 is significant. The titres of the sera of the females was uniformly higher than that of the males.

[These results are in harmony with those of other workers on this subject. The limit for Shiga (1 : 64) is perhaps rather high. Such limits however must not be taken as applying universally, since different strains of the same organism vary considerably in their agglutinability, a fact which the author omits to mention but which must never be lost sight of.]

E. E. A.

ASSINDER (Eric W.). **The Agglutination Reaction in Cases of Dysentery occurring during the Present War.**—*Birmingham Med. Rev.* 1916. Apr. Vol. 79. No. 452. pp. 89–97.

According to Assinder's agglutination investigations the dysentery we have had to deal with in this war is, in the great majority of instances,

bacillary in origin. Out of 26 sera which agglutinated Shiga's bacillus:—

14	agglutinated	with	1 in 160	dilution	(or more)
7	,,	,,	1 in 80	,,	(not in 1 in 160)
5	,,	,,	1 in 40	,,	(not in 1 in 80)

Of the 22 sera which agglutinated Flexner's bacillus:—

7	agglutinated	with	1 in 160	dilution	(or more)
9	,,	,,	1 in 80	,,	(not in 1 in 160)
8	,,	,,	1 in 40	,,	(not in 1 in 80).

[The author does not appear to be aware of the danger of using low dilutions of the patient's serum for the diagnosis of dysentery due to Flexner's bacillus. Most competent authorities agree that a dilution of serum of at least 1 in 100 must be used if all normal individuals are to be rigorously excluded. The statement that the dysentery of the war is for the most part bacillary is probably only true if the locality referred to is the Western front. A large number of cases of amoebic dysentery have been invalided from the Dardanelles both to the hospitals in Egypt and this country.]

E. E. A.

CHICK (Harriette). **The Preparation and Use of Certain Agglutinating Sera.** (With a Note on Preparation of Agglutinating Serum for *B. dysenteriae* Shiga by E. Jean DALYELL, M.B.).—*Lancet.* 1916. Apr. 22. pp. 857–861.

This is an excellent compendium of the art of making the agglutinating sera in common use to-day. It could be profitably studied by those whose business it is to prepare these sera. Many points of importance to those using them for diagnostic purposes are also discussed. A section at the end of the paper is devoted to the production of agglutinins for *B. dysenteriae* Shiga. Rabbits were injected intravenously with 20 million bacteria and gradually increasing doses at weekly periods for four or eight doses. The first dose was killed by heat, but the others were living cultures. An average titre of about 2,000 was obtained.

E. E. A.

WOLLIN (Hans). **Ueber die Brauchbarkeit des normalen Drigalski-Conradi-Agar für die Dysenteriediagnose.** [The Use of Ordinary Drigalski-Conradi-Agar for Dysentery Diagnosis.]—*Centralbl. f. Bakt.* 1915. Dec. 29. Vol. 77. No. 3. pp. 283–284.

The crystal-violet is often omitted from Drigalski-Conradi medium in the culture of dysentery bacilli, on the score that it inhibits or even prevents the growth of *B. dysenteriae* Shiga. The disadvantage of this modification is that the simultaneous search for typhoid bacilli,

which is often desirable, is necessarily much more laborious when the indicator is absent. The author shows by experiment that as a matter of fact the inhibition is very slight and recommends the use of the medium with crystal-violet.

E. E. A.

WAGNER (Gerhard). **Ein Bacterium dysenteriae mutabile.**—*München. Med. Woch.* 1916. Feb. 22. Vol. 63. No. 8. pp. 290–291. With 2 figs.

This purely bacteriological contribution deals with the variation of *B. dysenteriae* Shiga on a solid medium at room temperature. Colonies with and without a thick margin are produced. The original paper should be read by those specially interested in bacterial variation.

E. E. A.

CASTELLANI (Aldo). **Notes on Dysentery Vaccination.**—*Brit. Med. Jl.* 1916. Feb. 26. p. 306.

The author first describes a mixed dysentery vaccine, which he used some years ago, the bacilli being cultivated on peptone water. He has since given this up in favour of carbolised agar cultures. The vaccine is made from 24 hour agar cultures of the following strains :—

Shiga-Kruse	1000 million.
Flexner	1000 ,,
Hiss Y	1000 ,,
Flexner-like bacillus (No. 1) isolated in Ceylon	1000 ,,
Flexner-like bacillus (No. 2) isolated in Ceylon	1000 ,,

They are made up in normal salt solution with 0.5 per cent. phenol, so that 1 cc. contains 125 million of each strain. About 0·5 cc. is given subcutaneously and repeated in a week's time. The reaction is said not to be severe. Agglutinins are formed, but are inconstant.

Another vaccine consists of the above vaccine combined with the typhoid and paratyphoid (A and B) bacilli. It is given on the same lines. Broth cultures should not be used in the preparation of these vaccines as they give rise to severe local reactions. [The author does not bring forward evidence that the patients are protected by the treatment.]

E. E. A.

SEIFFERT (G.) & NIEDIECK (O.). **Schutzimpfung gegen Ruhr.** [Inoculation against Dysentery.]—*München. Med. Woch.* 1916. Feb. 29. Vol. 63. No. 9. pp. 329–330. With 2 curves.

The dysentery in the German army is mostly due to the Flexner-Y bacillus. The outbreak of a small epidemic afforded the opportunity to inoculate 2,000 people with a dysentery vaccine as a prophylactic measure. The vaccine was prepared from agar cultures of Y bacillus suspended in salt solution and heated for half an hour at 56° C. This thick emulsion was then further diluted in such a way that 1 cc. of suspension contained a loopful of bacilli. An addition of 0·5 per cent. phenol was made. Three injections were given at weekly intervals—0·5 cc. for the first and 1·0 cc. for each of the two succeeding ones.

Careful notes were made of the temperature, local and general reactions, etc., but as the dosage is not accurately given it is not worth while recording these in detail. Suffice it to say that the rise of temperature is considerably less than is usually experienced after a typhoid vaccine. The local and general reactions were very mild. The agglutination titer obtained was on the whole lower than in the case of typhoid vaccination. The practical result of the inoculations was that no further cases occurred in the infected district. It is only fair to state however that a sudden change of weather took place simultaneously, a cool spell with rain succeeding a period of excessive heat.

E. E. A.

HEVER (Karl) & LUCKSCH (Franz). **Ueber Ruhrschutzimpfung II.*** [Inoculation against Dysentery.]—*Wien. Klin. Woch.* 1916. Jan. 27. Vol. 29. No. 4. pp. 95–96.

The object of this investigation was to estimate the titer of the anti-bodies found in the serum of persons inoculated with dysentery vaccine. Fifteen men, who had been inoculated against typhoid two months previously, received 1 cc. of a polyvalent dysentery vaccine [strength unfortunately not stated]; seven days later 1·5 cc. of the same vaccine was injected. A preliminary test before the injections showed that a certain amount of agglutinin for both Shiga and Flexner bacilli was present, especially the latter, as well as bactericidal substances. The sera of these 15 persons were tested 14–18 days after the second injection. The effect of the inoculations was to drive up the bactericidal titer considerably but to leave the agglutinin titer hardly altered for both Shiga and Flexner strains. An attempt to estimate the antitoxic power of the sera failed. Incidentally the initial high titer with respect to Flexner agglutinins is in favour of the view, often expressed, that typhoid inoculation increases the production in the blood of protective substances directed against the nearly allied *B. dysenteriae* Flexner. The converse of this has been described, namely, that in the blood of dysentery convalescents immune substances against *B. typhosus* are to be found. From such considerations it is reasonable to assume that the trifling number of dysentery cases which have occurred during the present year of war are directly due to the almost universal use of anti-typhoid inoculation. This point however requires careful statistical study to establish it.

E. E. A.

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*For summary of the first communication see this *Bulletin*, Vol. 7, p. 218

Flagellate Dysentery.

Kennedy (Alex. Mills) & Rosewarne (D. D.). *Lamblia intestinalis* **Infections from Gallipoli.**—*Lancet.* 1916. June 10. pp 1163–1165.

The authors have examined 136 cases of "dysentery" from Gallipoli, and have found 12 cases in which "the bacteriological findings and the history suggest that the condition was dependent upon infection by *Lamblia intestinalis.*" Details are given of these 12 cases. "All the cases presented a dysenteric type of diarrhoea, with passage of blood and mucus of a considerable degree of severity, and usually associated with abdominal pains. Infection occurred on the Peninsula at varying intervals of time, from one day to six months after landing. Several of the men, although suffering severely from the diarrhoea, kept on duty for one or two months before going off sick." The infection was of long duration. It was found that hot drinks like tea had a tendency to start the diarrhoea again. The authors state that spontaneous improvement only occurred in some cases after a change to a cooler climate. It is noted that, according to Stitt, lambliasis is very important in the tropics.

[From the accounts given, it is clear that the faeces of the patients should have been examined more frequently, in order to be sure that no parasite other than Lamblia was present, since there is a periodicity in the appearance of protozoal organisms in the faeces.]

H. B. F.

Porter (Annie). **An Enumerative Study of the Cysts of** *Giardia* (*Lamblia*) *intestinalis* **in Human Dysenteric Faeces.**—*Lancet.* 1916. June 10. pp. 1166–1169. With 7 charts.

The results of a numerical study of the cysts of *Giardia* (*Lamblia*) *intestinalis* in the faeces of seven soldiers, patients in Liverpool, are given. Of the patients one was a case of pure lamblial diarrhoea from Flanders, the man not having been to the tropics. The remaining six were soldiers who had been to Gallipoli and were convalescing after dysentery. No Protozoa other than Lamblia were seen in them during the researches. The work was conducted during February, March and April, 1916. A daily sample of the stool of each patient was obtained from the hospital.

"Each sample was treated in the following manner. Half a cubic centimetre of sterile normal salt solution was poured into a finely graduated measuring cylinder, and to this faeces was added in tiny portions from different parts of the sample, until the level of the salt solution was at the one cubic centimetre mark. Thus an exact volume—namely, half a cubic centimetre—of faeces was measured on each occasion. This was further diluted with sterile normal saline solution and was thoroughly emulsified, the dilution being continued until an emulsion sufficiently thin for microscopical examination was obtained. The dilution varied with the consistency of the stool, dilutions of 10, 20, 40 and occasionally 80 being employed. A drop of the emulsion was placed in the chamber of a Thoma-Zeiss haemocytometer, precautions similar to those used in making blood counts being observed. Usually the counting chamber was filled four times over for each estimation, great care being taken to ensure that the emulsion was as perfect as possible before the sample drop was taken. The number of cysts in a cubic millimetre of the stool examined could thus be estimated. One-half cubic centimetre of stool was employed for dilution, whether the stool were formed, semi-formed, or diarrhoeic in character."

The volume of certain of the stools of different patients was determined on some occasions.

Details are given of the cases studied, as to their history, number of motions per day and treatment. All of them showed weakness, especially after exertion, and most had received injections of emetine before reaching England. The emetine injections seem to have had little action on Lamblia. The numbers of the cysts per cubic millimetre of faeces daily are recorded, together with the graphs thereof, showing daily variation.

The case of pure lambliasis from Flanders showed much blood in the motions on at least three occasions. The motions were also bulky, and were compared with mud, whipped cream and putty in character, being often khaki coloured. Beta-naphthol and mist. terebinthinae were tried and appeared of little use, though they were not pushed. Bismuth salicylate, one teaspoonful, three times daily, gave very encouraging results.

The daily examination of the cases led to the conclusion that "probably there is a greater uniformity of distribution of Lamblia cysts in a diarrhoeic stool than in a formed or a hard one. The distribution of cysts in different parts of a stool, however, varies to some extent, but attempts were made to allow for this in the taking of the sample and in the making of the emulsion. As a rule there appeared to be more parasites in a diarrhoeic stool than in one of firmer consistency." The possible numbers of cysts in a bulky stool, in a stool of average volume and in one of small volume are computed, the respective numbers of cysts per cubic millimetre of faeces being 14,000,000,000, 324,000,000, and 10,000,000, in round numbers.

Interesting general inferences are made. Relapses of lambliasis occurred. The pathogenicity of Lamblia is briefly discussed and the harmfulness of Lamblia cyst-carriers is indicated, especially where sanitation may be primitive (as in country districts), and there is danger of outbreaks of lamblial diarrhoea among children in Great Britain. The danger from rats and mice who can take up and harbour Lamblia, is also pointed out. Regarding the administration of drugs to eliminate Lamblia, it is stated that "probably when cysts are few in the stool of a person suffering from lambliasis, there are numerous flagellates in the duodenum and other parts of the intestine of the patient, and it would be well to try medicaments at such periods. Thus, it might be hoped that the flagellate organisms would be killed before they encysted, and the formation of a new 'crop' of cysts be thereby prevented." Casual examinations of infected stools, made at irregular intervals, lead to fallacious impressions and are condemned. Periodicity varies somewhat in different cases. In some there was a period of about a fortnight between the maximal crops of cysts; another period found was ten days.

H. B. F.

SANGIORGI (Giuseppe). **Lamblie e Spironemacee nell' intestino umano.** —*Pathologica.*—1916. May 15. Vol. 8. No. 181. pp. 162–164.

The author examined faeces of soldiers in Venetia. The faeces were dysenteriform and cholera was suspected. Search for cholera vibrios being negative, other excitants were looked for. Amoebae and Balantidia were absent, and the only organisms found in one soldier

were Lamblia. It is considered highly probable that Lamblia was the causal agent of the dysenteriform symptoms. Cubical epithelial cells were found in the stools, having been shed into the intestine, and lesions of the mucosa probably occurred where attached Lamblia were numerous.

Spirochaetes [inaccurately termed Spironemacea by the author] were found in the faeces of healthy and unhealthy persons. Apparently two main types of spirochaetes are distinguished. The author endeavours to separate the organisms of the first type into three subtypes, according to dimensions, but there appears to be little real distinction between them, as the lengths vary from $3{\cdot}2\mu$ to 8μ or 10μ and the breadths measure up to $0{\cdot}4\mu$ to $0{\cdot}5\mu$. The first type is correlated with *Spirochaeta eurygyrata.* The organisms of the second type are more rectilinear and measure 5μ to 10μ in length and a fraction of a micron in breadth. The ends may be truncated or tapering. The author thinks that the spirochaetes of his second type may be correlated with *S. stenogyrata.* The organisms were found in 20 per cent. of the cases of intestinal affections examined. He thinks that the spirochaetes may be harmless saprophytes which may have the power of becoming pathogenic, and speculates as to their origin.

H. B. F.

Low (George C.). **The Treatment of Lamblia Infections.**—*Brit. Med. Jl.* 1916. Mar. 25. p. 450.

The author recalls that previously he has pointed out that in cases of lambliasis treated by him, emetine, beta-naphthol and methylene blue all failed "completely to sterilise the patient of his infection." Apparent improvement occurred but was proved to be of a temporary nature only. Toxic symptoms following treatment with methylene blue were considered by Major Marshall and Gee, in an old paper of theirs, to be due to the difficulty of getting zinc-free methylene blue, and the use of extract of hyoscyamus with methylene blue to prevent bladder trouble was also recommended. Bismuth alone, salicylic acid alone, salol, thymol and cyllin have been ineffective in the experience of Dr. Low.

The author notes that cures of lambliasis may be more apparent than real, a purge causing the parasites to be voided again.

A patient infected with Trichomonas has also been under observation. The parasites seemed to disappear without treatment and had not reappeared at the end of one month. With regard to so-called successful treatments, the author is "certain that many so-called successes, if followed up for a sufficiently long period (six months to a year), would have to be written off and debited to the failure column."

H. B. F.

Rhamy (B. W.) & Metts (F. A.). **Flagellate Protozoa as an Etiologic Factor of Dysenteric Diarrhea. Report of a Series of Cases of Trichomonas Dysentery, including a Local Epidemic with Seventeen Deaths.**—*Jl. Amer. Med. Assoc.* 1916. Apr. 15. Vol. 66. No. 16. pp. 1190–1191.

One of the authors, during seventeen years laboratory experience, has never found flagellate Protozoa "except in cases with existing or

recent acute or chronic diarrhoea, and has become convinced that these parasites are of more importance as etiologic factors in diarrhoea than has been given them."

Trichomonas intestinalis, as seen by the authors, measured 17μ by 10μ, " with four or more flagella." The parasites live best in neutral or slightly alkaline media, and for this reason " any tissue of low vitality may harbour them." The cases were observed by the authors at various times in different parts of Indiana. In 1909 there was an epidemic of dysentery in Liberty Township, Wells County, Ind., and out of 78 cases there were 17 deaths.

Details are given of seven selected cases of pure Trichomonas infection observed between 1907 and 1915. The patients drank impure water, and a few days later they had diarrhoea with colicky pains, watery or slimy blood-stained stools, weakness, dyspnoea, loss of weight and progressive anaemia. The skin became yellow with a tendency to urticarial or pellagroid eruptions. The stools contained much mucus, pus, blood and active Trichomonas. The blood showed a moderate eosinophilia, from 6 to 12 per cent. The large bowel showed superficial ulcers.

Various treatments were tried, such as ipecacuanha with or without calomel, and emetine hydrochloride in doses of 0·5 to 1·5 grains daily for a week, followed by petroleum enemata. The cases responded thereto.

The authors report the cases in order " to call attention, first, to the incidence of a local epidemic and endemic, and second, to a not infrequent cause of acute or chronic diarrhoea." They are convinced that such cases " are not extremely rare."

H. B. F.

CHALMERS (Albert J.) & PEKKOLA (Waïnö). **A New Human Intestinal Flagellate in the Anglo-Egyptian Sudan.**—*Jl. Trop. Med. & Hyg.* 1916. June 15. Vol. 19. No. 12. pp. 142–146. With 3 figs.

The new human flagellate was discovered in the faeces of a European resident in the Sudan, who repeatedly suffered from attacks of diarrhoea. A few *Loschia coli* were found in his faeces, also a large flagellate and the new small one. The patient was given repeated doses of purgatives and salol. After one of the purgative doses, when the larger flagellates had nearly disappeared, the small one was found.

The flagellate is fusiform, pear-shaped or more rarely rounded, 5·6μ to 6μ by 2·8μ to 3μ. The circular nucleus measures 1·4μ, and has a central or excentric karyosome. The blepharoplast is well defined. Six anteriorly directed flagella arise from it. Two blepharoplasts may be present, and if so, three flagella arise from each. Two chromatic lines diverge from the blepharoplast or blepharoplasts, and end near the posterior margin in very minute chromatin particles. The lines are axostyles and the minute end particles are now named axoplasts. A posteriorly directed flagellum arises from each axoplast. Encystment and division have not been seen.

The classification of the organism is discussed in detail. It belongs to the Octomitidae, and to the genus Octomitus. The new Octomitid is named *Octomitus hominis*, and is defined as follows :—

"Flagellate non-amoeboid organism measuring about 6 × 3 microns and possessing six anteriorly directed flagella of variable size and sometimes of considerable length springing from a single or double well-marked blepharoplast situate close to the anterior margin. Nucleus, single, roundish, often homogeneous with well-marked membrane and sometimes with a karyosome, and situate at some distance from the anterior extremity.

"Two axostyles are present arising from the blepharoplast and ending near the posterior margin in two small chromatic particles (axoplasts) from which arise the posterior flagella. Periplast thin without markings, cytostome absent, cytoplasm with vacuoles but not swollen out with gelatinous material and not possessing chromatophores.

"Known habitat : Intestine of man in Anglo-Egyptian Sudan."

After repeated purgation and the appearance of large numbers of the Octomitus in the stools, salol seemed to produce excellent effects.

The authors note that Giardia, Octomitus and Blastocystis are all present in the Anglo-Egyptian Sudan.

H. B. F.

Mixed and Unclassed Dysentery.

Woodcock (H. M.) & Penfold (W. J.). **Further Notes on Protozoan Infections occurring at the King George Hospital.**—*Brit. Med. Jl.* 1916. Mar. 18. pp. 407–409. With 1 fig.

The faeces of 384 different cases were examined for protozoal parasites, 98 cases being positive. Blastocystis was omitted, as it was common, was considered to be non-pathogenic, and was perhaps not a Protozoön.

Table of Cases Examined, showing those Infected with Protozoa. (Total Cases, 384.)

	No. of Cases.	Percentage of Total.	Percentage of Positives.
Infected with Protozoa ..	98	25·5	
Flagellates :—			
Lamblia	22	5·7	22·4
Trichomonas	14	3·6	14·2
Macrostoma	11	2·8	11·2
Entamoebae :—			
E. coli	57	14·8	58·1
E. histolytica	8*	2·0	8·2
Coccidia :—			
Isospora	10	2·6	10·2

*"This is inclusive of one case of liver abscess, in which the parasites were recovered only from the wall of the abscess."

Most of the patients had been in Egypt or Gallipoli. A Lamblia infection was found from the French front, and a case (who had previously been in India) of a relapse of amoebic dysentery after six years occurred from there also. Notes are given of five of the cases of amoebic dysentery. One of them had liver abscess, and two others were carriers of cysts with no history of true dysentery.

Among six cases of amoebic cyst carriers, mention is made of one with small cysts of the *E. minuta* type, the cysts measuring 7μ to 8μ in diameter. The authors think that this type of cyst may be a distinct variety. The nuclei did not show centrioles.

Heavy infections of Lamblia are considered to be distinctly pathogenic. Beta-naphthol 15 grains, with bismuth salicylate 20 grains, thrice daily, "for some days," appeared to effect a cure in two cases. Turpentine in doses of 10 minims three times daily for four or five days was apparently successful in two cases, but failed in two others.

Fourteen cases of malaria were examined. Twelve showed the presence of *Plasmodium vivax*, and two of *Laverania malariae*.

H. B. F.

WENYON (C. M.). **The Protozoological Findings in Five Hundred and Fifty-Six Cases of Intestinal Disorder from the Eastern Mediterranean War Area.**—*Jl. R. Army Med. Corps.* 1916. Apr. Vol. 26. No. 4. pp. 445–460.

The paper records the results of the examination for protozoal infections of 556 cases of intestinal disorders among men invalided from Gallipoli and in hospital in the London area. About 1,500 separate microscopic examinations were made, extending from November [illegible], 1915 to January 8th, 1916. "In all cases the specimens [illegible]mined] were over three hours old," and in some cases they had been collected the day before. Some infections with unencysted Protozoa may thus have been overlooked, as free unencysted forms were present in only a small number of cases.

The danger of *Entamoeba histolytica* is pointed out with regard to the infected man himself, who may relapse into acute dysentery or develop liver abscess, and with regard to the community, as he may function as a carrier. Sixty cases of those examined were voiding cysts of *E. histolytica*.

Three cases of amoebic dysentery that came under the author's observation at various times and unconnected with the war are described in detail to illustrate the danger of the "carrier" of amoebae. The probable result of the introduction of numbers of carriers will be the appearance of cases of amoebic dysentery among the general public.

Regarding the action of emetine, the author remarks that "in most instances [it] causes the passage of the encysted forms to cease," as it attacks the unencysted forms beforehand. Details of the treatment with emetine of 15 cases of infection with *E. histolytica* are given. The author thinks that the injection of one large dose of the drug might have caused the infection to disappear as well as it did when several daily doses were employed over a longer period.

In cases infected with Lamblia, when large numbers occurred, much mucus was present in the stool. The flagellate Lamblia appeared in the mucus in almost pure culture, and the author suspects that they were the cause of the excessive mucus production.

In one case of infection with Isospora, the dysenteric symptoms observed are considered to have been due to the action of the Coccidium, no pathogenic bacteria having been isolated from the faeces. A summary of the protozoal infections found is as follows.

	Pure Infection.	Mixed Infection.	Total.
E. coli	138	79	217
E. histolytica	22	38	60
A. limax	1	5	6
Lamblia intestinalis ..	43	46	89
Trichomonas intestinalis ..	4	5	9
Tetramitus mesnili.. ..	—	4	4
Coccidium (Isospora) ..	2	13	15
Coccidium (Eimeria) ..	—	1	1

Some brief remarks on certain vegetable organisms are given, and there is a table of findings in each of the infected cases.

H. B. F.

FANTHAM (H. B.). **Remarks on the Nature and Distribution of the Parasites observed in the Stools of 1305 Dysenteric Patients.**—*Lancet.* 1916. June 10. pp. 1165–1166.

During the period January 21st to April 18th, 1916, the stools of 1,305 soldiers were examined. The men were in various hospitals in the Western Command, and were relatively convalescent, but had previously contracted dysentery chiefly in Gallipoli. Few cases, however, came from Flanders. Bacteria were not investigated by the author. The parasites, chiefly Protozoa, were observed in fresh preparations, and were as follows :—

No of patients	1291
„ „ in whom parasites were found	446
Total number of examinations made	3325
No. of examinations in which *Entamoeba histolytica* occurred	38
„ „ „ *Entamoeba coli* occurred	211
„ „ „ Noc's entamoeba „	2
„ „ „ *Amoeba (Vahlkampfia) limax* occurred ..	2
„ „ „ *Giardia (Lamblia) intestinalis* occurred ..	471
„ „ „ *Trichomonas hominis* occurred	2
„ „ „ *Chilomastix (Tetramitus) mesnili* occurred ..	1
„ „ „ *Cercomonas parva* occurred	2
„ „ „ Coccidia (apparently Isospora type) occurred..	4
„ „ „ Spirochaetes occurred ..	42
„ „ „ *Blastocystis enterocola* occurred	198
„ „ „ Taenia embryos occurred	1
„ „ „ Hymenolepis embryos occurred	1
„ „ „ Trichocephalus eggs occurred	3

Regarding the distribution of some of the parasites, the author remarks :—

"The proportion of examinations positive for *Entamoeba histolytica* is somewhat low on account of the relatively large number of injections of emetine received by the men before reaching England, some patients having had as many as forty injections. It will also be seen that the high proportion of examinations showing Lamblia is evidence that injections of emetine have apparently little action on these flagellates, many of the Lamblia cases having been previously treated with the drug. Administration of emetine by the mouth might perhaps be more efficacious in some cases."

At least one case of lamblial diarrhoea and one case of amoebic dysentery were found among soldiers who had only been on the western front in Flanders, and had never been in the tropics. A summary of the combinations of the parasites found in the 446 positive cases is given, and shows the various single and multiple infections. Single infections of Lamblia occurred in 137 cases and of *Entamoeba coli* in 81.

In addition 499 examinations were made of 14 special cases in Liverpool. The stools were examined daily. The parasites therein are recorded in the following table :—

No. of special cases, all of them parasitised	14
Total number of special examinations	499
No. of occasions on which *Entamoeba histolytica* was found	27
,, ,, ,, *Entamoeba coli* was found ..	45
,, ,, ,, *Giardia* (*Lamblia*) *intestinalis* was found..	348
,, ,, ,, *Trichomonas hominis* was found	1
,, ,, ,, *Chilomastix* (*Tetramitus*) *mesnili* was found ..	7
,, ,, ,, *Cercomonas parva* was found	3
,, ,, ,, Spirochaetes (*S. eurygyrata*) were found	36
,, ,, ,, *Blastocystis enterocola* was found	22

Details are given as to the single and multiple infections in these special cases. Variation in the periodicity times of the different parasites in a multiple infection is mentioned. Attention is drawn, from the figures, to the difficulty of completely eliminating parasitic Protozoa from the human alimentary tract, and to the importance of examining for parasite-carriers.

A. P.

ARKWRIGHT (J. A.), YORKE (W.), PRIESTLEY (O. H.) & GILMORE (W.). **Examination of Fifty Dysentery Convalescents for Carriers.**—*Brit. Med. Jl.* 1916. May 13. pp. 683–684.

The authors set themselves the task of examining 50 convalescent dysentery cases three to six months after the onset of the acute attack. They found nine persons still excreting *E. histolytica* and two still excreting *B. dysenteriae* Shiga. This gives 11 persons, or 22 per cent., as possible sources of infection. In both of the cases from which Shiga

was isolated, *E. histolytica* was also found. [The value of the analysis of the cases in this report is much diminished by the absence of any information as to where the investigation was carried out, and where the cases came from.] E. E. A.

TRIBONDEAU & FICHET. **Résultats de l'analyse bactériologique des selles dans 217 cas de dysenterie provenant du corps expéditionnaire d'Orient (C. E. O.).**—*Bull. Acad. Méd.* 1916. Mar. 14. Vol. 75. No. 11. pp. 317–318.

Of the 217 stools examined bacteriologically at Toulon from soldiers returning from the Orient with dysentery, 169 gave negative results as regards the bacilli known to cause the disease. This large proportion of cases may be partly explained by the fact that the majority of the soldiers were on the road to recovery by the time they arrived at Toulon. The 48 positive cases consisted of :—

Amoebic	10
B. dysenteriae Shiga	23
B. dysenteriae Y	2
Morgan's bacillus No. 1	13

One of the amoebic cases was known to be a carrier, and three others had called at Alexandria. This is the first time Morgan's bacillus had been suspected of being a causative agent in any disease other than epidemic infantile diarrhoea. [The connection between this bacillus and dysentery would have been more complete if agglutinins had been demonstrated in the sera of some of the patients from whom it was isolated.] E. E. A.

RUSSELL (B. R. G.). **Intestinal Disorders arising from Protozoal Infection.**—*Lancet.* 1916. June 10. pp. 1161–1163.

An account is given in this paper of three cases of infection with *Entamoeba histolytica* and one of lamblial infection. The third patient had contracted amoebic dysentery in Egypt about the middle of April, 1915. He was treated with emetine. In January 1916, when in England, entamoebae were again present in his faeces, and treatment with emetine was recommenced, to which the patient responded. The fourth case was an infection with *Lamblia intestinalis*, probably contracted on the way to Egypt, by drinking lemonade at Malta. Treatment by emetine was tried but the patient did not respond. However, he became better when he reached a cooler climate. The patient is now under treatment by thymol.

An experiment was undertaken with respect to the action of the Lamblia on the host. A loopful of faeces containing Lamblia cysts was rubbed up in milk and some was introduced into the pharynx of three mice by means of a pipette. Three days later, one of the mice was killed, and on examination it was found that two inches below the pylorus there were numerous flagellate Lamblia. In the lower part of the bowel, a few cysts were seen. The two remaining mice were killed, but they were negative. The controls also were negative. The author thinks that perhaps he " was too precipitate " in killing the experimental infected mouse [but sufficient precautions against spontaneous infection of the mice do not seem to have been taken].

H. B. F.

ROUSSEL (L.), BRULÉ, BARAT & PIERRE-MARIE (André). **Les associations de l'amibe et des bacilles dysentériques.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. Mar. 3 ser. Vol. 32. No. 7–8. pp. 261–273.

In July 1915, following the arrival of an African regiment, diarrhoea with blood and slime broke out in a territorial regiment with which they came in contact. It assumed the size of a small epidemic. In September it began to abate. Dysentery bacilli were isolated 76 times. The most notable anomaly about the epidemic was the failure of anti-dysentery serum. Some of the affected soldiers had previously been in Africa where they had contracted amoebic dysentery. An examination of the stools for protozoa gave many positive findings of *E. histolytica* and it was then recognised that the epidemic was in reality one of amoebic dysentery. Treatment with emetine and especially with neosalvarsan produced rapid and lasting recovery. Several amoebic cases occurred among soldiers who had never quitted their native land but had inhabited trenches formerly occupied by colonials. It may be questioned whether all the epidemics which have arisen during the war are not fundamentally amoebic, the secondary bacillary element having, in many cases, alone been studied. In these mixed infections it is always the amoeba which assumes the chief rôle.

The number of samples of faeces examined during seven months was 687, most of which contained blood and mucus. Dysentery bacilli, carefully identified, were found 76 times. In 15 cases bacilli were associated with amoebae. Some of the cases were purely amoebic, but it is doubtful whether pure bacillary dysentery existed. The agglutinative power of the serum was usually poor, which is in accord with the view that the bacillus is of secondary importance. The sera of 30 of the cases which had yielded bacilli in the faeces, were tested for agglutinins. Of this number 11 agglutinated neither the bacillus isolated from their stools nor yet the stock strain of *B. dysenteriae*; 13 agglutinated both their own and the stock strains; 6 did not agglutinate their own but did agglutinate certain other cultures; of these last, three, from which bacilli allied to Flexner had been isolated, agglutinated a strain of Flexner, while three others which had yielded Shiga, did not agglutinate their own bacilli, nor the stock Shiga strain, but did agglutinate Flexner's bacillus. Almost a half of the cases cited, therefore, agglutinated their own respective bacilli. Of 138 agglutinations carried out from August to December 1915, 47 were positive, including 33 Flexner, three Shiga and six both Flexner and Shiga. The serum dilutions for the test were 1 : 50 in the case of Shiga, and 1 : 80 to 1 : 100 in the case of Flexner. In the authors' experience normal persons never give a positive reaction with these dilutions. [Many authors consider 1 : 160 or 1 : 200 as the upper normal limit for Flexner.]

An examination of the bacilli isolated was made and several aberrant types were found as shown in the table (p. 141).

The moral to be learnt from these investigations is that even in our climate we are not justified in calling an epidemic true bacillary dysentery, although dysentery bacilli have been found in the stools, unless we have excluded the presence of amoebae by a careful search. This point is of great therapeutic importance. E. E. A.

	Number of samples isolated.	Action on Sugars.						Indol.	Agglutinations.				Pathogenic action on the guinea-pig.
		Mannite.	Maltose.	Glucose.	Levulose.	Galactose.	Saccharose.		Serum I. Anti-Flexner. 1 per 100.	Serum II. Anti-Flexner and Anti-Shiga. 1 per 50.	Serum III. Anti-Flexner and Anti-Shiga. 1 per 100.	Serum III. Anti-Shiga. 1 per 1000.	
Shiga type		0	0	0*	0	0	0	0	0	+	+	+	—
Flexner type		+	+	+	+	+	0	+	+	+	+	0	—
Microbes isolated													
Type I (Hiss)	46	+	0	+	+	+	0	0	+	+	+	0	Died in 36 hours.
Type II (Shiga) ..	10	0	0	+	+	+	0	0	0	+	+	+	Survived.
Type III (para-Flexner)	11	+	+	+	+	+	0	+	0	+	+ or 0	0	Died in 36 hours.
Type IV (para-Hiss) ..	3	+	0	+	+	+	0	+	0	+	0	0	Died in 12 hours.
Type V (para-Shiga) ..	4	0	0	0	0	+	0	+	0	0	0	0	Died in 12 hours.

*This is an error on the authors' part, as *B. dysenteriae* Shiga always ferments glucose.

ORTICONI (A.) & NEPVEUX, **Sur l'etiologie de quelques diarrhées et dysenteries rebelles.**—*Bull. Soc. Path. Exot.* 1916. May. Vol. 9. No. 5. pp. 293–299.

A cause can often be found for many of the indefinite diarrhoeas labelled "enteritis" or "chronic dysentery" if a careful search is made. Thus a small but ever-increasing number yield *E. histolytica* in the faeces, cases moreover which have never left France but have been closely associated with colonials or others who have been abroad. The authors also associate *Trichocephalus trichiuris*, *Ascaris lumbricoides* and *Lamblia intestinalis* with some cases of diarrhoea.

E. E. A.

FLUSSER (Emil). **Die Ruhr der Kindern in Russisch-Polen.** [Dysentery amongst Children in Russian Poland.]—*Med. Klinik.* 1916. Mar. 26. Vol. 12. No. 13. pp. 386–389.

In September 1915 a dysentery epidemic occurred in Russian Poland affecting the civil population. In the course of five weeks 28 cases were met with chiefly in children, as the following analysis shows :—

Age.	*No. of Cases.*
62	1
16	1
15	1
14	1
10	2
8	1
6	2
5	3
4	2
3	4
2	5
1	5

The disease is endemic in this country. Its greater incidence in the early years of life finds an analogy in the case of measles. In our country mothers look upon measles as an unavoidable illness for almost every child, one attack conferring immunity in most cases for a lifetime. In Poland it is the same with dysentery. The mothers think that everyone must sooner or later fall a victim to the disease and the sooner it is over the better. No measures therefore are taken to avoid infection and it is a common sight to see several children playing round the cot of an infected child, in fact coming into the closest contact with it. The people consider that one attack protects the individual against further trouble. In addition they say that there is more danger to adults than to children, a fact which the author's experience seems to confirm. Certain points of difference mark the course of dysentery in children. In the first place the haemorrhagic stage is shorter. During October and November 1914 the cases occurring amongst soldiers and civilian adults were serious in comparison with those seen amongst the children. Prodromal or initial symptoms, appearing some time before the passing of blood, are common but are seldom found in adults. Vomiting, rigors, abdominal disturbances

and headache are often seen prior to typical stools. The haemorrhagic period usually lasts from five to seven days. The number of stools is excessive—five, six, and even twelve in an hour. Genuine symptoms of intoxication are only seen in the initial stage. Not only the large gut but the whole digestive tract becomes involved. When the blood disappears from the motions the child does not become convalescent as is usual with grown-up people but enters upon a new stage the symptoms of which are determined by the extent of damage to the digestive system. Four children in their first year, watched throughout the course of the disease, could tolerate no other food than their mother's milk. All of them suffered from meteorism. There was a tendency in all to exhibit a subfebrile temperature. While the temperature during the haemorrhagic stage was normal or subnormal, in the next stage it varied between 37·5° and 38° C. If breast-fed the child was usually well in from one to two weeks after the disappearance of blood from the stools.

As regards treatment, breast-feeding was chiefly relied upon. Sucklings received no medicinal treatment. In the case of older children opium was of great use for counteracting the painful tenesmus of the acute stage. Purges were never used.

E. E. A.

ROBERTS (Dudley). **A Clinical Study of Chronic Diarrhea.**—*Amer. Jl. Med. Sci.* 1916. Feb. Vol. 151. No. 2. (No. 527). pp. 259–266.

An analysis of 74 ambulant cases of chronic diarrhoea, selected in the sense that the patient's condition justified thorough and repeated examination, but excluding carcinomatous and syphilitic ulceration. Both kinds of dysentery are rare in New York, so that chronic diarrhoea is relatively infrequent. About a third of the cases showed achylia gastrica, by which is meant that there was no free H Cl in the test meal, together with a low total acidity. The author considers that this condition renders the individual more susceptible to chemical, mechanical and microbic injury. [Diminished gastric acidity has been observed as a frequent concomitant of true dysentery.] Another group of the cases without achylia showed ulcerative colitis, five amoebic in origin and six non-amoebic. Amoebae can best be demonstrated by taking scrapings from the ulcerated patches with a dull curet. As regards treatment of chronic colitis 3 oz. doses of bismuth subcarbonate once a week were combined with daily rectal injections of 8 to 16 ozs. of a 10 per cent. solution of gelatin at a temperature of 120° F. A diet rich in cellulose or the hemicellulose agar helps to prevent recurrence. These cases have nearly all done well in spite of gastric conditions. The author reports two severe cases of intractable dysentery passing blood which were cured permanently by 40 minim daily doses of " trimethyl-methoxy-phenol " by the mouth, and the addition of it to gelatin injections. It is said to be non-toxic as it is not absorbed from the intestine.

Other causes are neurotic conditions, stasis of the colon (eight cases), hyperthyroidism (nine cases), pancreatic disease, Addison's disease (five cases).

E. E. A.

LIEBERS. **Ueber Polyneuritis nach Enteritis.**—*München. Med. Woch.* 1916. Mar. 7. Vol. 63. No. 10. pp. 369–370.

The author points out that irregular muscular and joint pains are frequent in the convalescent stages of many acute diseases, with or without definite evidences of nerve implication. Many of these are put down as purely neurasthenic, but the author thinks that if sufficient care is taken, especially in the neuritis following diarrhoea attacks, a cause can be found. He gives in detail the report of one case. The patient was a soldier who had at first symptoms of dysenteric diarrhoea; he returned to duty but from increasing weariness and difficulty of breathing had again to report sick. He had difficulty in swallowing, speech was nasal and thick, there was some giddiness and diplopia, but no other abnormal nerve reactions. Later, subjectively a blunted sense of feeling was noted over the whole body, objectively a right sided abducens paralysis and paralysis of soft palate on both sides was found with an absence of knee reflex and high degree of ataxia; Romberg's sign was positive. The weakness and ataxia increased, extending to the upper extremities. The Wasserman test was negative. After four weeks he began to improve.

In the discussion of the cause it is noted that no information as to the kind of enteritis which was the chief feature at the commencement of the disease could be obtained, but examination of the blood showed moderate agglutination reactions to B. pseudo-dysentery D. Kruse (1/50) and to nothing else; this was obtained three to four months after the intestinal symptoms had passed off. The whole nerve symptoms were so peculiar that the author was driven to the conclusion that the case was one of polyneuritis after enteritis or perhaps pseudo-dysentery.

P. W. Bassett-Smith.

MOORHEAD (T. Gillman). **A Note on Dysenteric Arthritis.**—*Brit. Med. Jl.* 1916. Apr. 1. p. 483.

On the strength of six cases the author believes that an arthritis exists which is a complication of amoebic dysentery, and curable with emetine. The knee-joint was the one most severely attacked. The absolute proof that the condition was due to *E. histolytica* is lacking. Fluid was not removed from any of the joints for examination.

[Bacillary dysentery was unfortunately not excluded in these cases.]

E. E. A.

SZÉCSY (Eugen). **Die Diät- und balneotherapeutische Behandlung der Dysenterie.** [Dietetic and Balneotherapeutic Treatment of Dysentery.]—*Wien. Med. Woch.* 1916. Mar. 4. Vol. 66. No. 10. pp. 364–367.

The diet must be regulated with an eye to the pathology and pathological anatomy of dysentery. The food must neither irritate mechanically nor chemically. No solids must be given at first.

In conjunction with careful dieting the author has found that a kind of spa treatment gives excellent results in acute bacillary dysentery. For the first three days drinks of half per cent. sodium sulphate in any alkaline mineral water are taken thrice daily. A small glassful of this hypertonic solution is drunk at a time. Afterwards, the

strength and number of drinks per diem are gradually reduced. Thus we pass through isotonic to hypotonic solutions. This treatment was tried in 47 cases—41 Flexner and 6 Shiga. The most marked features were tolerance of food, and change of blood and mucus stools to profuse but painless motions, which by degrees became normal as the strength of the salt was reduced. Some of the cases had been treated previously with bad results but the sodium sulphate drinks combined with careful dieting speedily produced complete cure.

E. E. A.

RATHERY & FOURNIOLS. **Quelques réflexions touchant le traitement des dysenteries.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1916. Feb. 10. Vol. 32. 3 ser. No. 3–4. pp. 133–140. With 2 charts.

The experience of the authors during the war has been that both emetine and anti-dysentery serum are sovereign remedies. In those cases in which they are said to have been unsuccessful, they have almost certainly been inappropriately administered owing to mistaken diagnosis. We have to guard against the inclination to class dysentery coming from warm countries as amoebic and that coming from cooler climates as bacillary. Laboratory examinations are most helpful, especially the microscopic investigation of the *fresh* stool and the agglutinating power of the patient's serum. The authors consider that an agglutination in a serum dilution of 1 : 20 is diagnostic for Shiga, while they adopt DOPTER'S standard, namely, 1 : 100 dilution for Flexner. The examination of faeces for specific bacteria is a more elaborate procedure and not always practicable.

The authors have noticed that emetine exerts its action in two stages.

1. Rapid fall in the number of stools by the next day after the injections. The number then remains constant (2–6 a day).

2. Towards the 8th or 10th day faecal matter again appears in the stools and the patient is cured.

In addition to specific treatment the authors have had some success with rectal washes of silver nitrate, and also with methylene blue (0·5 gm. to the half litre). The subcutaneous injection of physiological serum, 500 cc. twice a day, is useful in the severe dysenteric diarrhoeas in conjunction with temporary complete abstinence from food.

E. E. A.

DIRKS (Emil). **Beitrag zur Bolus-alba-Behandlung bei Ruhr.** [Bolus Alba Treatment of Dysentery.]—*München. Med. Woch.* 1916. Mar. 21. Vol. 63. No. 12. pp. 441–442.

Several dysentery patients in a military hospital complained of considerable nausea after taking bolus alba, amounting in some instances to vomiting; in addition there was much abdominal pain, particularly when blood was present in the faeces. To combat this tincture of opium was added. Administration by the mouth was combined with rectal injections also containing tincture of opium. The powder forms a protective covering on the ulcerated surfaces. About 100 grams Bolus to the ½ litre, with 10 drops Tinct. Opii. is used. The passage of blood quickly ceases and the diarrhoea comes to an end.

E. E. A.

MOSZKOWSKI. **Ein Mittel zur Bekämpfung der blutigen Stühle.** [Treatment of Bloody Stools.]—*Berlin. Klin. Woch.* 1916. Jan. 31. Vol. 53. No. 5. pp. 114–115.

This consists in an intestinal wash with an emulsion of iodoform :—

Iodoform	80 gram.
Gum arabic	100 „
Distilled water	180 cc.

A soft sound is introduced for a distance of 20 in. per rectum, a procedure which is not very difficult with a little practice. The knee-elbow position may be used if necessary. By means of a small glycerin syringe 45–50 cc. of the well-shaken solution is vigorously introduced. Thirteen patients were treated by this method, the number of injections varying from one to five (nine in a very severe case) before the passage of blood ceased. Tenesmus disappeared early, usually after the first injection. These cases were apparently not dysentery as faeces and blood examinations gave negative results. The probable action is that the gum arabic brings about the blood stasis while the iodoform induces rest and has an astringent effect on the intestinal wall. In addition its disinfecting power may play an important part in the healing of the ulcers.

E. E. A.

SPRUE.

WOOD (Edward J.). **The Occurrence of Sprue in the United States.**—*Amer. Jl. Med. Sci.* 1915. Nov. Vol. 150. No. 524. pp. 692–699.

The article opens with a historical survey. Sprue occurs in the Southern States. It has been greatly confused with other diseases, notably pellagra, but it is undoubtedly a disease *sui generis*. The distinctive features of the two conditions may be perhaps best expressed in tabular form:—

Sprue.	*Pellagra.*
1. No salivation	Salivation a conspicuous symptom.
2. Little or no pain from glossitis, pharyngitis, etc.	Pain acute.
3. No skin lesions	Skin lesions often, though not invariably, present.
4. No nervous symptoms	Organic nerve lesions common.
5. Stools light in colour, acid reaction with much gas. Very foul and limited to the early hours.	Stools darker and more fluid. Also more or less mucus and tenesmus. Not limited to early hours.
6. Great fat and nitrogen loss which points to the possibility of the pancreas being involved.	Fat and nitrogen absorption normal.

E. E. Atkin.

ASHFORD (Bailey K.). **Studies in Moniliasis of the Digestive Tract in Porto Rico.**—*Amer. Jl. Med. Sci.* 1915. Nov. Vol. 150. No. 524. pp. 680–692.

Sprue is characterised by four cardinal conditions:—(1) Sore tongue, (2) Excessive intestinal fermentation, (3) Light foamy diarrhoea, (4) Diminution in size of the liver. It is a chronic disease interspersed with periods of relative health. Ashford considers that he has found the cause in a new species of Monilia, a yeast-like fungus which he has cultivated on artificial media from the tongue of practically all his cases [see this *Bulletin*, Vol. 7, p. 4, and also Vol. 6, p. 237]. The fungus can be found in the superficial cells of the tongue in the early stages only. It is seldom found in healthy individuals. Complement fixation tests were positive, normal controls being negative. Monilia can also be isolated from the faeces of cases of sprue. There is a high correlation between districts where bread is eaten and the occurrence of the disease. There appears to be a predisposition to sprue in persons of northern birth. A mycotic septicaemia can be produced in small laboratory animals by this species of Monilia.

E. E. A.

FALCONER (E. H.) & ROWE (Albert H.). **A Case of Sprue with Necropsy.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1916. Jan. Vol. 3. No. 7. pp. 400–405.

A report on the post-mortem findings in a single case of sprue. The clinical features were fairly typical, showing the sprue tongue, small liver, and characteristic stool. This patient also suffered with marked nausea and vomiting. At the autopsy the intestines were found to be distended and oedematous. The mucosa of the small intestine was oedematous and showed the presence of a few scattered minute haemorrhages. No other pathological lesions which could be attributed to sprue were observed. The disease was complicated by pulmonary tuberculosis.

E. E. A.

ASHFORD (Bailey K.). **The Dietetic Treatment of Sprue.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1916. Jan. Vol. 3. No. 7. pp. 377–389.

As there is at present no specific treatment, dieting is of paramount importance in sprue. There are three recognised methods of feeding—milk diet, meat diet and fruit and vegetable diet.

Milk diet.—This is the best if it can be carried out. The milk must be fresh, with a low bacterial count, rich in fat and unboiled. It is given in increasing doses, cold, and very slowly by means of a straw or glass tube. At least ten minutes should be allowed for each milk ration, the aim being to obtain small flocculi in the stomach which may easily be penetrated by the weak gastric secretion. Milk soured with a liquid culture of a Bulgarian strain of the lactic acid bacillus is very well tolerated by most patients, and should be given if the patient does not find it too unpalatable. It is whipped with an egg-beater before taking. In whatever form decided upon the milk is taken every two hours. A laxative dose of castor oil is given at the start and repeated every four days to clear the intestines of fermented material. When milk alone becomes irksome a few bananas may be added to the diet. If there is a distinct idiosyncrasy for milk it should be modified in some way, as is done in the case of infants. A good way is described by the author as follows :—

> "A green plantain is peeled and cut into thin slices which are thoroughly dried in the hot sun. They are then powdered in a mortar and from this powder an 'atol' or gruel, is made. Strange to say, this gruel with its high content of plantain starch, when mixed in varying proportions with milk has often a most felicitous result in the feeding of sprue patients, intolerant of milk alone."

After several weeks of a milk diet the improvement in the patient's general condition is remarkable.

Meat diet. In cases requiring the milk diet to be extended beyond 24 days, meat may be given as a break. One half to two pounds of fillet of beef finely chopped, with two ounces of suet added if the meat is free from fat, is allowed per diem, in six equal portions at three-hourly intervals. It is heated in a well buttered saucepan just sufficiently to bring out the aroma but leave the mass of the meat red. It is then served hot. If a painful emptiness is felt at night on this diet a cup of hot water containing 10 grs. of bicarbonate of soda may

be taken. Repugnance to meat in this form is soon established and chicken, fish, or fruit may be substituted for one or two feedings, while fresh vegetables and salads may be added in another week.

This diet is not so good as a milk diet and should therefore only be resorted to when milk cannot be taken.

Fruit and Vegetable Diet. When both of the above diets are not tolerated recourse must be had to this diet. Bananas are the staple fruit. The author cites a case of sprue cured by a diet of bananas alone—15 to 20 or more were consumed in a day. Any available vegetables may be given in conjunction, which do not contain much starch like potatoes.

After a month or six weeks on a strict diet carbohydrates may be gradually added, returning to the strict diet on the slightest suspicion of a relapse. Sugar should be restricted as long as possible, as well as an excess of greasy food, including cakes and pastry.

Results of Treatment. A selection of 98 cases has been made, all of which presented the typical features of sprue in their entirety.

Treated by milk or some of its modifications.

Died	7 or 8·43	per cent.
Cured	50 „ 60·2	„
Improved	21 „ 25·3	„
Unimproved	5 „ 6	„

Treated by meat alone or by meat, fruits and fresh vegetables, or by fruit alone, or combined with fresh vegetables :—

Cured	3
Improved	2

Cases observed for a long period in which a liberal carbohydrate element was added to the diet by the patient :—

Unimproved	5
Died	5

E. E. A.

Gonzalez Martinez (I.). **The Complement Deviation Reaction applied to the Diagnosis of Moniliasis of the Digestive Tract.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1916. Jan. Vol. 3. No. 7. pp. 390–391.

The antigen was prepared from three strains of Monilia isolated by Ashford from cases of sprue. After incubating the cultures on Sabouraud's glucose agar for three days they were ground up, suspended in 10 cc. of normal salt solution and shaken for two hours. Phenol 0·5 per cent. was added. It was then heated for one hour at 56°. A unit of this antigen was taken to be 0·4 cc. Some three or four cases of sprue gave a positive complement deviation reaction, while a dozen sera sent in for Wassermann reaction served as controls and were all negative.

E. E. A.

Ashford (Bailey K.). **Further Experimentation in Animals with a Monilia commonly found in Sprue.**—*Amer. Jl. Med. Sci.* 1916. Apr. Vol. 151. No. 4. pp. 520–528.

Monilia X, isolated from nearly 100 cases of sprue, causes death from septicaemia when inoculated into guinea-pigs and white rats. The injections were mostly intraperitoneal. On artificial media the strain soon loses its virulence, which is quickly restored by passage through susceptible animals. A recently isolated culture from a case of sprue when fed to an animal usually will not kill it; exaltation of virulence by passage through animals must first be undertaken. Ashford believes that a sudden primary pneumonia followed by a secondary septicaemia leads to the death of the animals. Failing these lesions they succumb more slowly to intestinal intoxication. Monilia septicaemia induces necrotic areas in lungs, liver, kidneys, and spleen, known as "white spots." Localised in the skin, typical blastomycotic ulcers are formed, due to necrosis without pus formation. Monilia has not been seen to give rise to pus. The experimental animals that have died of septicaemia show lesions most frequently in the lungs; the next most frequent site is the kidneys.

E. E. A.

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BRUG (S. L.). Morphologische Studien an *Proteosoma praecox*.—*Arch. f. Schiffs u. Trop. Hyg.*, 1916.

BRUG (S. L.). Die schwarzen Sporen ("Black Spores") bei der Malaria-infektion im Mückenkörper.—*Arch. f. Protistenk*, 1916.

CARINI (A.) & MACIEL (J.). Quelques hémoparasites des Oiseaux du Brésil.—*Bull. Soc. Path. Exot.*, 1916.

FANTHAM (H. B.). Remarks on the nature and Distribution of the Parasites observed in the Stools of 1,305 Dysenteric Patients.—*Lancet*, 1916.

FANTHAM (H. B.). Observations on *Spirochaeta eurygyrata*, as found in Human Faeces.—*Brit. Med. Jl.*, 1916.

HOWARD (L. O.). Remedies and Preventatives against Mosquitoes.—*U.S. Dept. Agric. Farmers' Bull.* 444. 1915. July. 15 pp.

HOWARD (L. O.). House Flies.—*U.S. Dept. Agric. Farmers' Bull.* 679. 1915. July 14. 25 pp. With 15 figs.

HOWARD (L. O.). Economic Loss to the People of the United States through Insects that carry Disease.—*U.S. Dept. Agric. Bulletin*, No. 78. 1909. Mar. 18. 40 pp.

HINE (James S.). Habits and Life Histories of some Flies of the Family Tabanidae.—*U.S. Dept. Agric. Technical Series.* 1906. No. 12. Pt. II. 38 pp. With 12 figs.

HUTCHISON (Robert H.). The Migratory Habit of Housefly Larvae as Indicating a Favourable Remedial Measure. An Account of Progress. *U.S. Dept. Agric. Bull.* No. 14. 1914. Feb. 28. 11 pp.

HUTCHISON (R. H.). A Maggot Trap in Practical Use: An Experiment in House-fly Control.—*U.S. Dept. of Agric. Bulletin.* 200. 1915. May 4. 15 pp. With 4 figs.

KOPKE (Ayres). Estudo da doenca do sôno. Memoria premiada no concurso de 1915 e apresentada sob a divisa: Therapia Sterilisans Magna. 114 pp. 1916.

MALLOCH (J. R.). American Black Flies or Buffalo Gnats.—*U.S. Agric. Technical Series* No. 26. 1914. Apr. 6. 70 pp. With 6 plates.

MARLATT (C. L.). The Bedbug (*Cimex lectularius L.*).—*U.S. Dept. Agric, Circular* No. 47. Revised Edit. 1907. Feb. 26. 8 pp. With 3 figs.

MITZMAIN (M. Bruin). Tertian Malarial Fever. Transmission Experiments with *Anopheles punctipennis*.—*U.S. Public Health Reps.* 1916.

MITZMAIN (M. Bruin). *Anopheles punctipennis* Say. Its Relation to the Transmission of Malaria.—Report of Experimental Data relative to Sub-Tertian Malarial Fever.—*U.S. Public Health Reps.* 1916.

PORTER (Annie). An Enumerative Study of the Cysts of *Giardia* (*Lamblia*) *intestinalis* in Human Dysenteric Faeces.—*Lancet.* 1916.

SERGENT (Edmond). Rapport sur le Fonctionnement de l'Institut Pasteur d'Algérie en 1915. 20 pp. With 1 chart. 1916. Alger: E. Pfister.

Note.—On direct application (not through agents or booksellers) any of the foregoing reprints or pamphlets will be sent on loan to any part of the world, the Bureau paying outward postage.

Books received.

FANTHAM (H. B.), [M.A. Cantab., D.Sc. Lond.], STEPHENS (J. W. W.). [M.D. Cantab., D.P.H.] & THEOBALD (F. V.), [M.A. Cantab., F.E.S., Hon. F.R.H.S.]. The Animal Parasites of Man. Partly adapted from Dr. Max Braun's "Die tierischen Parasiten des Menchen." (4th Edition, 1908) and an Appendix by Dr. Otto Seifert.—xxxii + 900 pp. With 423 text-figs. 1916. London: John Bale, Sons & Danielsson Ltd. [Price 45*s*. net.]

GOETHALS (George W.) [Major-General U.S. Army]. The Panama Canal. An Engineering Treatise.—Vol. I. 527 pp. Vol. II. 483 pp. With Illustrations. 8vo. 1916. New York & London: McGraw-Hill Book Co. Inc. [Price 31*s*. 6*d*. net.]

LEE (Arthur Bolles). The Microtomists' Vade-Mecum. A Handbook of the Methods of Microscopic Anatomy.—x + 526 pp. Demy 8vo. 7th Edit. 1913. London: J. & A. Churchill. [Price 15*s*. net.]

SHIPLEY (A. E.), [Sc. D., F.R.S.]. More Minor Horrors.—x + 163 pp. With 1 plate and 49 text-figs. 1916. London: Smith, Elder & Co. [Price 1*s*. 6*d*.]

TRANSACTIONS OF THE INTERNATIONAL ENGINEERING CONGRESS. 1915. Materials of Engineering Construction.—v + 656 pp. With Illustrations. 1915. San Francisco, California.

YULE (G. Udny) [M.A.]. An Introduction to the Theory of Statistics.—xv + 382 pp. Crown 8vo. With 53 figs. and diagrams. 3rd Edit. Revised. 1916. London: C. Griffin & Co., Ltd. [Price 10*s*. 6*d*.]

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